Shri Ashtapad Maha Tirth

Part II

Looking for the lost (*Lupt*) Tirth
A Geo-Scientific Research Study

Compiled & Edited By

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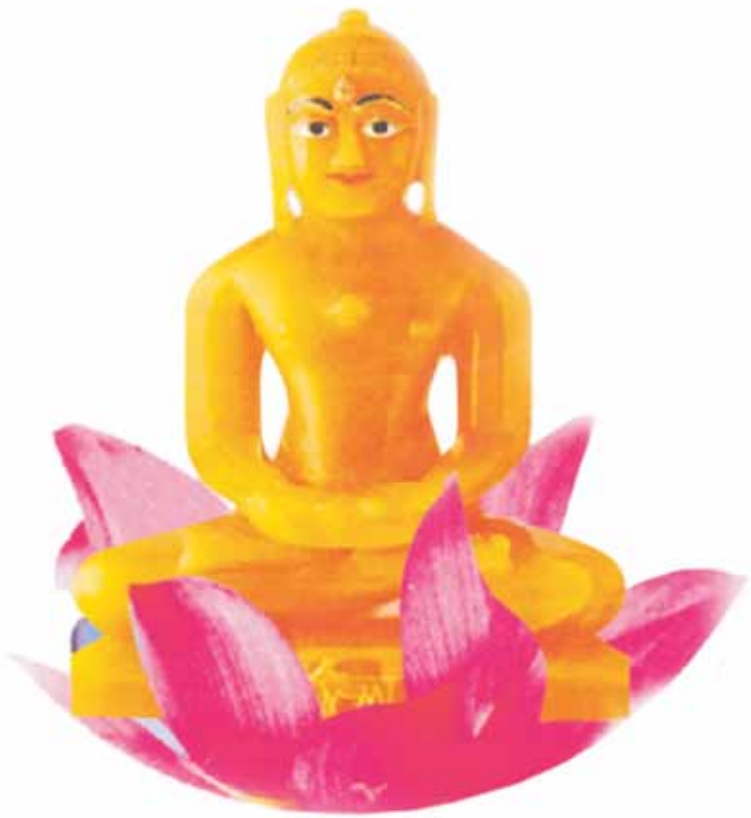
|| Shri Rushabhdevay Namah ||



निर्वाणं यत्र संजातमादिनाथस्य मुक्तिदम् ।
गिरिमष्टापदं वन्दे सदानन्दप्रदं सताम् ॥ १ ॥

જ્યાં શ્રી આદિનાથ ભગવાનનું નિર્વાણ થયું છે તે
મુક્તિને આપનાર તથા સજ્જનોને આનંદ આપનાર
અષ્ટાપદગિરિને હું વંદન કરું છું.

Dedicated to all Jains
around the world

Ashtapad Maha Tirth
written on the book ledge (side strip) is carved from
original Ammolite Stone

Front Astar – Kailash and Ashtapad photo is taken from a commercially available poster in Nepal

Message From Jawahar A. Shetti, *Chairman, JCA*

Dear Sadharmik Brothers and Sisters

Jai Jinendra

Jain Center of America, New York (JCA) publication of Granth I was presented to you recently. Hope you had chance to go through and enjoying the details regarding Shri Ashtapadji Tirth and its history.

Now with great pleasure JCA is presenting Granth II to Jain community around the world. This part deals with research work done under JCA, as well as other related topics. There are eleven chapters in this Granth II. Granth will have one DVD containing all research material from volume I-XX with Granth I and II, and a second DVD containing Ratna Mandir, Kailash Mansarovar video, etc. Both parts of Granth will shed light on history of Shri Ashtapadji as well as the research work that is being done. These two part Ashtapadji Granths are one of a kind of Literature on Ashtapadji has never been compiled and there has not been a Granth written exclusively on Ashtapadji.

JCA celebrated first anniversary of Shri Ashtapadji and Shri Chovisi on June 18, 2011 with great joy and success. Many visitors are visiting JCA and greatly appreciating the Crystal Mountain Shri Ashtapdji and precious Gem stone Shri Chovisi installed in the Mountain.

Shri Chovisi and Shri Ashtapadji Mountain is a generous gift from Dr. Rajnikant Shah and his family to the Jain Center of America, New York. All members of Jain Center of America, New York thank Dr. Rajnikant Shah and his family and will cherish this for generations to come.

Research work was done under leadership of Dr. Rajnikant Shah, who has devoted his time and efforts. Many scholars and scientists have visited Kailash Mansarovar mountain region for research work. The research work has taken more than five years. Jain Center of America, New York thanks all of the team members for their joint efforts, dedication and time.

Printing of this Granth was made possible by generous donation from Sadharmik brothers and sisters of our Center.

1. Shri Jayantibhai Punamchandbhai Shah
2. Shri Ravchandbhai Kakkalbhai Sanghavi
3. Shri Dhudalal Punamchandbhai Hekkad
4. Shri Lalbhai Ratanchandbhai Kothari
5. Shri Bachubhai & Madhuben Mehta
6. Smt Chamelibai, M/O Kushal, Suresh & Sunita Sacheti
7. Shri Revchandbhai and Pasiben Shah
8. Drs. Rajnikant and Niranjana Shah

Jain Center of America, New York thanks all Granth sponsors, DVD, Bag and Silver book mark sponsors for Granth I and II for their support.

Jain Center of America, New York is a unique and united Temple where all five Jain traditions pray under one umbrella. Now Shri Chovisi and Ashtapadji mountain makes it more of a very unique Jain Tirth for Jains around the world to visit. Jain Center of America, New York welcomes all. This Granth is a reminder to all Jains to keep our heritage going.

I thank all our members and supporters without whom it would not have been possible.

Thanks & Regards

યાત્રા અષ્ટાપદની...

પ્રાચીન કાળથી કૈલાસગિરિ ભારતીય અને તિબેટીયન પ્રજાનું સૌનું શ્રદ્ધાકેન્દ્ર રહ્યું છે. જૈનો તેને અષ્ટાપદ તરીકે જાણે છે.

જૈન આગમગ્રંથો તેમજ તે પછી આજ સુધીનો જૈન રચનાઓમાં અષ્ટાપદ વિશે અનેક ઉલ્લેખો ઉપલબ્ધ છે. એ દૃષ્ટિએ અષ્ટાપદ વિશે અભ્યાસ અને સંશોધનકાર્ય થાય તે ઈચ્છનીય હતું.

આ દિશામાં સૌથી પ્રથમ આવકારદાયક પગલું ન્યૂયૉર્કના જૈન સેન્ટર ઑફ અમેરિકાએ ભર્યું અને અષ્ટાપદ વિષયનું ઉપલબ્ધ તમામ સામગ્રીને એકત્રિત કરવાનું કામ શરૂ થયું જેના ૨૦ વૉલ્યુમો તૈયાર થયા. તે પછી ભારતમાં વિવિધ સ્થાને પ્રદર્શનો અને સેમિનારો યોજીને લોકજાગૃતિ ઊભી કરી. આના અનુસંધાનમાં જ ૨૦૦૬માં તા. ૨૮ મે થી તા. ૨૦ જૂન ડેલીગેટ સાથે એક સ્ટડીગ્રુપ તેમાં જોડાયું એમાં મને પણ જવાનો લાભ મળ્યો. તે પછી બીજીવાર પણ ૨૦૦૭ અને ૨૦૦૯ માં માનસ યાત્રાઓ યોજાઈ હતી.

આ બધાં પ્રયત્નોના પરિણામ રૂપે ૨૦૧૦ માં ન્યૂયૉર્કમાં જૈન સેન્ટર ઑફ અમેરિકા તરફથી અષ્ટાપદજી ચૈત્યનો પ્રતિષ્ઠા-મહોત્સવ સંપન્ન થયો. આમ સુશ્રાવકવર્ય ડૉ. રજનીકાંતભાઈ શાહનું એક સુંદર સ્વપ્ન મૂર્તિમંત બન્યું.

પ્રસ્તુત ગ્રંથમાં અષ્ટાપદ અંગે વિવિધ વિસ્તૃત જાણકારી તેમજ સામગ્રી આપવામાં આવી છે એટલે તેને અષ્ટાપદનું એનસાયકલોપીડીયા કહીને તેનું મૂલ્યાંકન કરવું ઉચિત ગણાશે.

- ધર્મ લાભ

તારીખ : ૩૧-૧૦-૨૦૧૧
જ્ઞાન પંચમી

લી. પ્રવર્તક મુનિશ્રી મૃગેન્દ્ર વિજય

Blessing from Pujya Shri Chitra Bhanuji

March 9th 2012

My dear Dr. Rajnikant bhai and all the members of Jain Sangha,

I send my blessings and appreciation to you and your family and Jain Sangha who have created a monumental crystal Ashtapad Tirth in New York for liberation (moksha) from raga and dvesha, attachment and aversion and birth and death.

Rajnikantbhai is a man of vision. With his devotion and dedication this Crystal Ashtapad became possible.

Ashtapad is a unique spiritual Tirth. The meaning of Tirth is to swim across the ocean of life. It is not for worship but practice of Ahimsa and Jivadaya in all aspects of life. Ashtapad derives its name from the fact that it has eight steps to go up the mountain ("Ashta" means eight and "pad" means steps in Sanskrit).There is a symbolic meaning behind these eight steps. Eight steps represent eight karmas that cover the nature of the consciousness.

The four harming karmas (*ghātiyā karmas*) directly affect the soul powers by impeding its perception, knowledge and energy, and also brings about delusion. These harming karmas are: *jñānavārana* (knowledge-obscuring karma), *darśanāvarana* (perception-obscuring karma), *antarāya* (obstacle-creating karma) and *mohanīya* (deluding karma). The four non-harming category (*aghātiyā karmas*) is responsible for the soul's physical and mental circumstances, longevity, spiritual potential and experience of pleasant and unpleasant sensations. These non-harming karmas are: *nāma* (body-determining karma), *āyu* (lifespan-determining karma), *gotra* (status-determining karma) and *vedanīya* (feeling-producing karma), respectively.

Bhagwan Rushabhdev step by step overcame his eight karmas and attained omniscience and moksha.

Realising the symbolic meaning of this Ashtapad, each one of us must try to overcome the eight karmas and attain moksha. We must all make effort to maintain the sanctity and purity of this Tirth.

Love and Blessings

Blessing from Pujya Roop Chandraji Maharaj Saheb

मंगल संदेश

दिनांक : 16/12/2011

श्रावक-श्रेष्ठ डॉ. रजनी शाह

ॐ स्वस्ति। श्री अष्टापद महातीर्थ ग्रंथ का दूसरा भाग प्रकाशित होने जा रहा है, यह संवाद आप द्वारा मिला। बहुत बहुत बधाई।

भगवान ऋषभदेव की निर्वाण भूमि श्री अष्टापद जी पर जिस लगन और समर्पण भाव से आप शोध-कार्य में लगे हैं, वह स्वर्णाक्षरों में लिखने योग्य है। दिगम्बर ग्रंथों में ऋषभदेव भगवान का निर्वाण कैलाश गिरि माना गया है। अष्टापद और कैलाश पर्वत एक ही हैं अथवा अलग-अलग पर्वत है, यह भी अन्वेषणीय हैं।

सन् 2003 जुलाई में अपनी अष्टापद-कैलाश यात्रा में मैंने पाया, कैलाश-पर्वत का आकार-प्रत्याकार जैन ग्रंथों के वर्णन से काफी मिलता जुलता है। जैन ग्रंथों में उल्लेख है भगवान ऋषभदेव के निर्वाण के पश्चात् भरत चक्रवर्ती ने पर्वत पर रत्न-सुवर्णमय जिनालय बनवाये। उन जिनालयों की पवित्रता बनाये रखने के लिए उसने पर्वत के निचले भाग को सीधा-सपाट और गोलाकार कर दिया। इस वर्णन के साथ आज के कैलाश पर्वत की काफी सदृशता लगती है। किन्तु कैलाश का ऊपरी हिस्सा पूरी तरह बर्फ की सघन परतों से ढका रहता है। इस स्थिति में वहां पर आवास-निवास और किसी तरह का निर्माण-कार्य संभव नहीं लगता।

अब रही अष्टापद जी की बात। कैलाश पर्वत के समीप ही स्थित पर्वत को हिन्दू परंपरा अष्टपद कहती है। इसी पर्वत पर आरोहण करके हिन्दू तीर्थ-यात्री कैलाश-दर्शन करते हैं, रुद्राभिषेक हवन के साथ भगवान शिव की पूजा-अर्चना करते हैं। हमने भी यहीं से जैन ध्वज के साथ णमोकार महामंत्र, श्री भक्तामर स्तोत्र तथा आरती द्वारा भगवान ऋषभदेव का स्तुति-गान किया था। इस अष्टापद पर्वत पर आरोहण, आवास तथा निर्माण-कार्य भी संभव है। मैं अपना अनुभव इसलिए कलम-बद्ध कर रहा हूं यदि शोध-कार्य में इसका कोई उपयोग हो सके।

कभी-कभी मन में ऐसा भी आता है कि अष्टापद-कैलाश के वर्तमान जलवायु में तथा ऋषभदेव भगवान के समय के जलवायु में क्या अंतर हो सकता है? आज जून-जुलाई माह में भी जहां टेम्प्रेचर माइनस दस से नीचे रहता है, ऑक्सीजन अत्यंत अल्प-मात्रा में उपलब्ध है। इसलिए मनुष्य, पशु-पक्षी ही नहीं पेड़-पौधे भी नहीं पनप पाते हैं। इस स्थिति में भगवान ऋषभदेव का हजारों मुनियों के साथ अष्टापद पर्वत पर विराजमान होने का उल्लेख जलवायु की दृष्टि से भी गहरे अनुसंधान की आवश्यकता मांगता है।

इसमें कोई संदेह नहीं अष्टापद-कैलाश पर्वत का वातावरण बहुत ही पावन और दिव्य है। जहां तक नजर जाए हिम-आच्छादित पर्वतों की कतार अद्भुत है। उस दिव्य भूमि पर भगवान ऋषभदेव के निर्वाण-स्थल अष्टापद/कैलाश पर्वत के निश्चित निर्णय तक आपका शोध-कार्य पहुंच सके, यही मंगल कामना है।

Roop chandra Muni

आचार्यश्री रूपचन्द्र

जैन आश्रम, नई दिल्ली

Blessing from Pujya Nirmal Sagar Ji

Dr. Rajnikant Shah is a staunch follower of Jainism. His background history is well known to all Jains based in America and back home in India. His high profile work and research on the Ashtapad Tirth is very interesting and appreciative. The time, energy and hard labor put in by him in doing the research of our lost Tirth has brought some hope to the people of Jainism that it still exists somewhere in the Himalayas.

We all know about Ashtapad Tirth through our Jain scriptures but Dr. R. Shah has thrown some extra light to our knowledge. One day I am sure that the movement started by Dr. R. Shah to discover Ashtapad would be successful and we would be able to have *Darshan* there.

Ashtapad Tirth is the most outstanding Tirth of Jain Religion. The most auspicious Tirth and probably the only place in the universe where mankind has not been able to see the marvelous carvings and idols made from precious stones. The technology used at that time to make this Tirth in this region is a total mystery to mankind.

It shows that science has still not achieved that growth, where they are able to locate the exact location of Ashtapad. It is probably the only Tirth that is not visible for us to have *Darshan*.

After Gautama Swami's visit, the Tirth has virtually become extinct- a mystery that has not been resolved till now.

I am curious to know the whereabouts of the Tirth and at the same time I believe in the decision taken by our Gyani people at that time to hide it from the eyes of the current generations, is justified. Sometimes some ancient Tirth hidden from us is a boon by itself.

With the changing of countries' border lines, the discovery of the same may lead to various disputes among nations and the consequences are unknown to us.

I bless the book brought out by Dr. R. Shah and we should all make an effort to read the same so we can learn more about our Ashtapad Tirth and the research put behind it.

God Bless everyone.

Good Wishes

Blessing from Pujya Manak Muniji Maharaj Saheb

- ॐ ह्रीं अर्हं नमः -

'महाशक्तिशाली महातीर्थ श्री अष्टापद का पुनः अभ्युदय"
'पूज्य गुरुदेव श्री मनक मुनि जी महाराज'

समय की शक्ति अनन्त होती है। समय की परतों के नीचे इतिहास के अनेक तथ्य, घटनाएं, स्थान आदि लुप्त हो जाते हैं, गुप्त हो जाते हैं। ऐसा ही एक स्थान, जो कि न केवल जैन इतिहास - परंपरा अपितु पूरी मानव जाति के इतिहास और सभ्यता से जुड़ा हुआ अति महत्वपूर्ण स्थान श्री अष्टापद पर्वत सहस्राब्दियों के दीर्घ अन्तराल तथा भौगोलिक एवं सांस्कृतिक परिवर्तनों के कारण लुप्त - गुप्त हो गया। इस युग की मानव सभ्यता के आदिकर्ता, आदि महामानव, आदि तीर्थंकर भगवान श्री आदिनाथ का निर्वाण कल्याणक स्थान है यह महातीर्थ अष्टापद। शास्त्रों एवं ऐतिहासिक ग्रन्थों के अनेक पृष्ठों पर उल्लिखित, संदर्भित, परिभाषित यह अष्टापद महातीर्थ काल के दीर्घ प्रवाह में उपेक्षा व उदासीनता का शिकार हो गया। यही कारण है कि अतिपावन इस महाशक्ति के केन्द्र पूज्य तीर्थ को जानने - खोजने का सामूहिक सार्थक प्रयास शायद अभी तक नहीं हुआ।

जैन परंपरा के अति महत्वपूर्ण इस महातीर्थ अष्टापद को खोजने - जानने का गुरुतर दायित्व उठाया है जैन सेन्टर ऑफ अमेरिका, न्यूयार्क ने और इसको क्रियान्वित किया है दृढ़ संकल्प और लगन के धनी डा. रजनीकान्त शाह व उनकी टीम ने। वर्षों के सतत अनुसन्धान - खोज - श्रम से डा. शाह और उनकी टीम ने सदियों से उपेक्षित इस महातीर्थ को पुनः प्रतिष्ठित - परिलक्षित करने की दिशा में प्रशंसनीय - अनुमोदनीय प्रयास किया है। इस महान् कार्य में जिनका भी प्रत्यक्ष - परोक्ष योगदान रहा है वे सब धन्यवाद के पात्र हैं नए इतिहास का सर्जन करने के लिए शत-शत बधाई।

शास्त्रों - ग्रन्थों के अनेक सन्दर्भों से परिपूर्ण श्री अष्टापद महातीर्थ ग्रन्थ का प्रथम भाग बहुत सुन्दर - सुसज्जित आकार में प्रकाशित हो गया है। अनुसन्धान परक यह दूसरा भाग पाठकों के सामने आ रहा है। स्वल्प समय में इतने बड़े ग्रन्थ का संकलन - संपादन - प्रकाशन करने के लिए इस परिकल्पना - परियोजना के पुरोधा डा. रजनीकान्त शाह व उनकी समर्पित टीम को बहुत - बहुत साधुवाद - आशीर्वाद।

विद्वानों, जिज्ञासुओं, अनुसन्धानकर्ताओं और श्रद्धालुओं के लिए ये ग्रन्थ अष्टापद जी के बारे में नई दिशा दर्शक बनेंगे यही विश्वास और शुभकामना।

- ओम् शान्तिः शान्तिः शान्तिः -

Blessing from Pujya Charukeerthi Bhattarakji

OM Namo Adhinatha Tirthnkaraya Namaha

Swasthi Shree Charukeerthi Bhattarak
Panditacharyavarya Swamiji,
Kund Kund Acharya Moolsang samsthana
Jain Matha Moodbidri, Dist-s.k, Karnatak
574227 PH-91-8258-325105

It is immense pleasure to read the Ashtapad Granth Part 1 which exposes good old historic religious Siddha Kshetra (Holy shrine).

It was a big task to investigate the Ashtapad area. The text and pictures reveal the fact that Adi Deva pronounced his preaching to the universe at this holy shrine which needs to be researched and properly established. The book has done great research work to locate it.

There is no doubt that this book is trying to present religious historic and archaeological evidences.

Dr. Rajnikant Shah and Dr. Niranjana Shah, from Jain Center of America, New York and other dedicated Jain religious team members for Ashtapad should be honored for coordinating research work.

This part II of Ashtapad Granth includes documents of all research work done and references. This will truly propagate the Jain Religion, philosophy and tradition to the whole world.

May lord 1008 Sri Chandogra Parshwanatha Swamy, Shrutha Devi and Jina Shahan Mathaa Kushmandini Diety of Moodbidri Athishya Jain Kashi Tirth, bliss and shower blessings to one and all who are committing their precious time for putting together the holy auspicious Ashtapad Granth Part II.

Badram Bhuyaath Vardhatam Jinashashanam

With Blessings

Bharath Bhushan Swasthi Sri Charukeerthi Bhattarak Swamiji

Blessings From Bhai Shri Nalin Bhai Kothari

Born as humans, our only objective of this life is to shed all karmas and free ourselves forever from the state of enslaved embodiment. In my endeavors to achieve this, I zealously try to understand how Lord Tirthankars lived and functioned. How they cultivated various virtues and gathered courage for their emancipation.

In the year 2010, I was fortunate to be present at the auspicious opening ceremony of Shri Ashtapad Maha Tirth at Jain Center of America, New York. In this magnificent Jinalay, I was joyfully amazed to see the replica of Shri Ashtapadji Tirth which was being installed, carved out of crystal along with the 24 *Tirthankar pratimas* carved out of various gemstones. The replica was so elegant that I wondered how beautiful will be the original Tirth. If the Idols made by humans are so exceptionally beautiful, then how majestic would be the real true Ashtapad Mountain created by God - Nature which stands proudly near Mount Kailash in the Himalayan ranges. *Uttaraadhyayan Sutra* calls Ashtapadji the pinnacle of all Jain tirth. I congratulate Dr. Shah for installing such a splendid Ashtapadji Tirth and am sure that these two volumes of Ashtapad Maha Tirth shall arouse interest and inspire many to take this pilgrimage.

After reading and hearing the historical facts and hypothesis of this great place of pilgrimage I decided to visit the holy Mansarovar and the sacred Mount Kailash as well as the pious Ashtapadji.

For the first time such a large contingent of 92 Jain soul seekers, *mumukshus* of Shree Raj Saubhag ashram undertook such a *yatra*. Ashtapad *puja* was conducted with five Jain idols – two of Lord Rushabhdev and one each of Lords Munisuvrat, Parshvanath, and Mahavir in a small marquee on the shores of Mansarovar. The *puja* was part of a three-day *Aradhana Shibir* which included meditation sessions and *swadhyays* on the significance of Ashtapadji. The following day, the idols were taken half way up the Ashtapadji Mountain and placed at a suitable location for conducting *Ashtaprakari puja*. The *puja* was preceded by *Chaitya Vandan* and followed by *aarti mangal divo* conducted in a very divine atmosphere.

The spell cast by nature in the luxuriant realms of Kailash Mansarovar in Tibet is still uppermost in our minds. It was indeed a journey to the abode of the Gods and a dip into the divinity of our souls. Heights of thought, vistas of hope, depths of meaning and stillness for reflections is what we experienced while observing acres of undulating hills washed in rainbow colors, snowy clouds sniffing at peaks, a limpid sky peering through white cliffs at the horizon. In this journey, like many adventurers of past times, each one of us made discoveries. These discoveries were of our own possibilities, endurance and stamina, of what we can achieve when we are driven by inner resolve, *Sankalpa Bala*, with faith in our True Guru and his compassionate grace. Presently we nurse our spiritual dreams knowing that Bhagwan Rushabhdev enables us to understand and realize what is truly ours.

With warm regards & best wishes,

(From Shree Raj Saubhag Satsang Mandal - Sayla)

हे अष्टापद शतशत प्रणाम

१. जिसने जन्म अयोध्या में ले भूतल स्वर्ग बनाया
जिसके मुख का दर्शन करने स्वर्गपति झट आया
गिरि सुमेरु पर भक्तिभाव से जाकर न्हवन कराया
नाभिराज मरुदेवी निज जीवन सफल बनाया ॥ हे

२. उशी वृषभ ने जन जन को श्रावक का मार्ग बताया
असि मसि कृषि सेवा शिल्पादिक का सन्मार्ग दिखाया
फिर असार संसार जान तप त्याग मार्ग अपनाया
नाभितनय श्री ऋषभनाथ ने केवल ज्ञान उपाया ॥ हे

३. दिव्य देशना देने प्रभुजी अष्टापद पर आये
धन्य गिरी कैलाश हो गया प्रभु चरणाम्बुज पाये
इन्द्रराज ने स्वर्गपुरी से मणि माणिक बरसाये
भक्त जनों ने दर्शन कर भवभव पातक विनशाये ॥ हे

४. समवसरण में सुनी सभी ने जिनकी अमृत वाणी
द्वादशांगमय तत्वप्रधानी जीवमात्र कल्याणी
ज्ञाता द्रष्टा चेतन तू है अजरअमर अविनाशी
जड़ तत्त्वों से भिन्न स्वरूपी शाश्वत ज्ञान प्रकाशी ॥ हे

५. शुक्ल ध्यान आरुढ ऋषभ ने भव बन्धन विनशाया
निज स्वरुप में लीन प्रभु ने मुक्तिधाम को पाया
चक्रवर्ती सम्राट भरतने जिन मंदिर बनवाये
अष्टापद गिरि है निर्वाण भूमि - श्रद्धा सुमन चढ़ाये ॥ हे

६. कोटि कोटि बीते बसन्त है ऋषभनाथ गुणगाते
गिरि सम्मेद चम्पा पावा गिरनारी दर्शन करते
किन्तु नहीं सामर्थ्य हमारी अष्टापद पर जायें
नाभितनय श्री ऋषभनाथ के चरणों की रज पायें ॥ हे

७. बड़े पुण्य से अमरीका में जैन संघ के भाग्य जगे
सिद्ध क्षेत्र अष्टापद के निर्मित करने के भाव जगे
मनभावन न्यूयार्क शहर में जिन मंदिर शोभा का धाम
तीर्थंकर चौबीसों सोहें अष्टापद को करें प्रणाम ॥ हे

८. अखिल विश्व में एसा अनुपम मंगलकारी अति अभिराम
समता शांति परमपद दायक क्षेत्र यही है सुख का धाम
हे श्रावक गण यहा पधारो सिद्ध क्षेत्र चौबीस जहाँ
दर्शन करलो पातक हरलो अष्टापद का तीर्थ यहाँ ॥ हे

९. अष्टापद से निर्झर बहता रत्नत्रय जयकारा है
परम अहिंसा अपरिग्रह अरू अनेकान्त की धारा है
धर्मबंधुओ मन वचन तन से काटो कर्म, करो वंदन
जैन सेन्टर ऑफ अमेरिका का हम करते हैं अभिनन्दन ॥ हे

– डॉ. पं. खेमचंद जैन

अष्टापद नायक आदि प्रभु की अष्टपदी मंगल आरती

जगमग जगमग करें आरती आदिनाथ भगवान की ।
धर्म-चक्र के आद्य प्रवर्तक तीर्थंकर गुणखान जी ॥ १ ॥

अयुधपुरी में जन्मे स्वामी, नाभिराय के प्यारे थे ।
मरुमाता बलिहारि हुई, तुम त्रिभुवन के उजियारे थे ॥
भरत-बाहुबली, ब्राह्मी-सुन्दरी युत शत सन्तति पाई थी ।
राजतिलक जब हुआ आप का कर्मभूमि हरषाई थी ॥
उन्हीं से आदि-देव कहाये ऋषभदेव भगवान जी ।
धर्म-चक्र के आद्य प्रवर्तक तीर्थंकर गुणखानजी ॥ २ ॥

असि-मसि-कृषि की शिक्षा दे जन-गण का कष्ट मिटाया था ।
विद्या-शिल्प-वणिज सिखला कर धर्म मार्ग दिखलाया था ॥
भारत देश के जनक भरतजी अब भी माने जाते हैं ।
लिपि ब्राह्मी ओ अंक सुन्दरी अब भी जाने जाते हैं ॥
गोम्मटेश बाहुबली जगत के अचरज हैं महान जी ।
धर्म-चक्र के आद्य प्रवर्तक तीर्थंकर गुणखानजी ॥ ३ ॥

वैराग्य-निमित्ति नीलांजन-नर्तन, दीक्षास्थली प्रयाग-पुरी ।
अक्षय त्रिति इक्षु रस आहारदा हस्तिना-नृप श्रेयांसश्री ॥
ज्ञान-सूर्य पुरिमताल पे ऊगा, अष्टापद निर्वाण थली ।
मानतुंग के भक्ति-स्त्रोत से गई टूट तालों की लड़ी ॥
कुण्डलगिरि बड़े-बाबा की है मूरत अति महान जी ।
धर्म-चक्र के आद्य परवर्तक तीर्थंकर गुणखान जी ॥ ४ ॥

ऋषभ जिनेश्वर प्रथम प्रवर्तक थे दुनियां ने मान लिया ।
तिब्बत के अष्टापद से निर्वाण हुआ था जान लिया ॥
सूक्ष्मशोध को गठित हुआ इक अन्तर्राष्ट्रीय फ़ाउन्डेशन ।
लक्ष्य बनाया सभी विधागत सभी सूचना एकत्रण ।
अखिल विश्व के जन-गण से सहयोग करें आह्वान जी ।
गिरि कैलाशा पर भी हो प्रभु-स्मृति का निर्माण जी ॥ ५ ॥

जे सी ए के जन-गण-मन का सार्थक हुआ उपार्जित द्रव्य ।
यू एस ए-न्यूयॉर्क-क्वीन्स के क्षेत्र में जन्मा मन्दिर भव्य ॥
सहस दूसरे दस के सन मे बीस जून का काल पवित्र ।
भावों की मंगलमय परिणति, हुआ अष्टापद बिम्ब प्रतिष्ठ ॥
चौबीस जिनालय दर्शन कर के धन्य करें मन-प्राण जी ।
वन्दन-पूजन-आरति के फल, पायें सब आतम धाम जी ॥ ६ ॥

दन्य नगर यह, धन्य डगर यह, अमर हुआ अमरिका देश ।
सत्या अहिंसक धर्म शरण का फैलाने शाश्वत संदेश ॥
अनेकांत का बोध कराने, अपरिग्रह का देने निर्देश ।
करुणा, मैत्री ओ प्रमोद का दिखलाने सुंदर परिवेश ॥
शांति का चिर मार्ग सुझाने केंद्र बना अभिराम जी ।
वंदन रूप अचिंत्य फल पा बनें अभय, निष्काम जी ॥ ७ ॥

जगमग जगमग करें आरती आदिनाथ भगवान की ।
धर्म-चक्र के आद्य प्रवर्तक तीर्थंकर गुणखान जी ॥
जगमग जगमग करें आरती आदिनाथ भगवान की ।
धर्म-चक्र के आद्य प्रवर्तक तीर्थंकर गुणखान जी ॥ ८ ॥

- अभय जैन कासलीवाल

जुलाई २००३ श्री अष्टापद-कैलाश तीर्थ पर प्रभु-चरणों में समर्पित कुछ मुक्तक

एक बार फिर इस गरिमापूर्ण आयोजन के लिए न्यूयॉर्क जैन-संघ को बधाई ।

सत्यं और सुन्दरं शिव का जो निवास है,
ऋषभदेव की तपोभूमि निर्वाण-वास है,
दसों दिशाओं में बिखरी है जहाँ दिव्यता
अष्टापद-कैलाश विश्व का चिदाकाश है ।

धरती और गगन का जो अद्भुत संगम है,
नहीं समझना सुगम, पहुँचना भी दुर्गम है,
केवल अनुभव-गम्य, परे जो वाणी-स्वर से
भारत की आध्यात्मिक संस्कृति का उद्गम है।

अमल थवल यह शिखर सनातन श्वेताम्बर है,
है आधार दिगम्बर शाश्वत शिव-शंकर है,
ऐसा ही है दृश्य सामने इन आंखो के
अम्बर में धरती है, धरती में अम्बर है ।

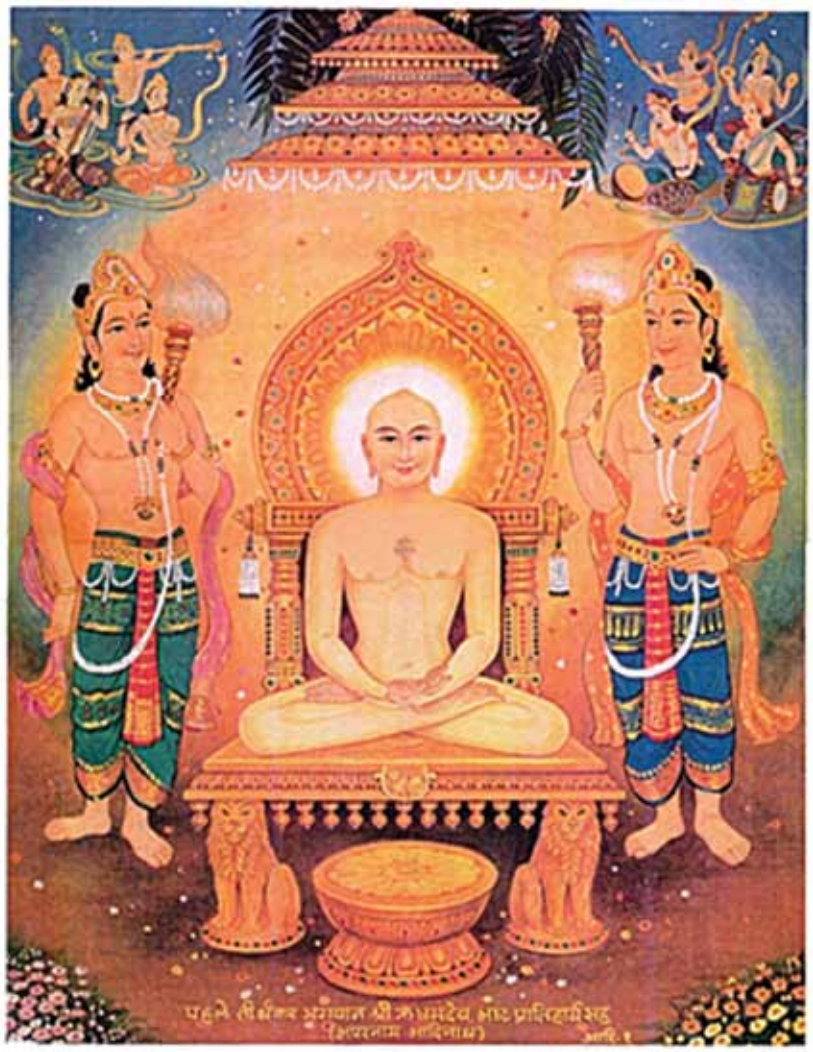
कुदरत के कण-कण में बिखरी भगवत्ता है,
कदम-कदम पर बिछी हुई चिन्मय सत्ता है,
उस शिव ऋषभदेव की दैवी उपस्थिति का
अनुभव करने, दृष्टि जरुरी अलवत्ता है ।

हिम-आच्छादित शिखर स्वयं शाश्वत मंदिर है,
देवो का अधिवास यहां इसके अन्दर हैं,
जैसी श्रद्धा, उनके पाएं पावन दर्शन,
जो अरुप के विविध रूप शिव-सुंदर है ।

महादेव श्री ऋषभदेव का ध्यान करें हम,
इस अद्भुत अद्वैत द्वैत का ज्ञान करें हम,
गूंज रही है गौरव-गाथा जिसकी जग में
श्री अष्टापद जी का अनुसंधान करें हम ।

आचार्य रूपचन्द्रजी
जैन मंदिर आश्रम
नई दिल्ली

Shri Adinath Bhagwan with Ashta Pratiharya



આજ દેવ અરિહંત નમું, સમરું તારું નામ,
જ્યાં જ્યાં પ્રતિમા જિન તણી, ત્યાં ત્યાં કરું પ્રણામ;
શત્રુંજય શ્રી આદિદેવ, નેમ નમું ગિરનાર,
તારંગે શ્રી અજિતનાથ, આબુ ઋષભ જુહાર;
અષ્ટાપદ ગિરિ ઉપરે, જિન ચઉવિસે જોય
મણિમય મૂરતિ માનશું, ભરતે ભરાવી સોય.

-શ્રાવક કવિ ઋષભદાસ (૧૭મી સદી)

I bow down in reverence to ArihantaBhagawan repeatedly recite the name of Arihanta with great reverence. I bow to ShriAdidev at Shetrunjaya, ShriNeminath at Girnar, ShriAjitnath at Taranga and RushabhDev at Abu. I bow down to his idol wherever it is installed, may it be on the Ashtapad Mountain where Chakravarti Bharat has installed beautiful gemstone idols of all the twenty-four Tirthankars.

Rushabhadas - 17th Centur

With Best Compliments

In loving Memory of our parents,

Jayaben and Hirjibhai Mehta

From

Madhuben and Bachubhai Mehta
Pramodiniben and Hasmukhbhai Mehta

With Best Compliments

Shah Jayantibhai Punamchandbhai (JUNADEESA) and Shah Shardaben Jayantibhai

As a symbol of respect to our parents for showing us the path of religious values and knowledge.

From

Snehal Jayantibhai Shah
Vipul Jayantibhai Shah
Mehul Jayantibhai Shah

Saloni Snehal Shah
Ketu Vipul Shah
Anuvi Mehul Shah

With Best Compliments

Chameli Bai Sacheti

M/O

Kushal, Suresh and Sunita Sacheti

With Best Compliments

In ever grateful and reverential remembrance of
Param Pujya Vardhaman Taponidhi Acharya Bhagwant
Shri Vijay Bhuvan Bhanu Surishwarji Maharaj

From

Kesarben Ratanchand Kothari Family - Lalitbhai - Sumitraben
Mitesh - Rupal (Romil, Saumil, Maunil)
Jagruti - Kalpesh (Himani, Prina, Parth)
Sejal-Sachin (Moksh, Harsh)

With Best Compliments

Hekkad Dhudalal Punamchand & Hekkad Bhuriben Dhudalal

Param pujya Ba tatha Bapuji,

Aapna Sanskar Vaarsaa ne naman kariye chhiye...
Sadaa vahetaa prem ane Ashirvaad naa Abhilashi Chhiye...

Hekkad Dhudalal Punamchand Parivar (JUNADEESA)
S. Vinodkumar USA, Inc.
f.k.a. Indian Diamond Imports, Inc.

With Best Compliments

Ravchandbhai K. Sanghavi

Chanchiben R. Sanghavi

Sevantibhai R. Sanghavi

Vasantlal R. Sanghavi

This Granth is dedicated in fond memories to our beloved ones !

Smt. Ramilaben S. Sanghavi - Smt. Bhartiben V. Sanghavi
Kirtibhai S. Sanghavi - Rameshbhai R. Sanghavi - Chandrakantbhai R. Sanghavi
Sanjay - Kalpesh - Ketan - Amit - Jayesh - Abhay - Viren - Aagam - Yash

(Sanghavi Family & Sanghavi Exports International Pvt. Ltd.)

With Best Compliments

In loving Memory of our parents

Revchandbhai and Pasiben Shah

From

Drs. Rajnikant & Niranjana
Kumarpal & Mridula
Smt. Subhadraben Tarachand
Chandra & Narottam
Late Bhogilal & Kamlaben
Subhash & Pramila

With Best Compliments

Dr. Rajnikant Shah

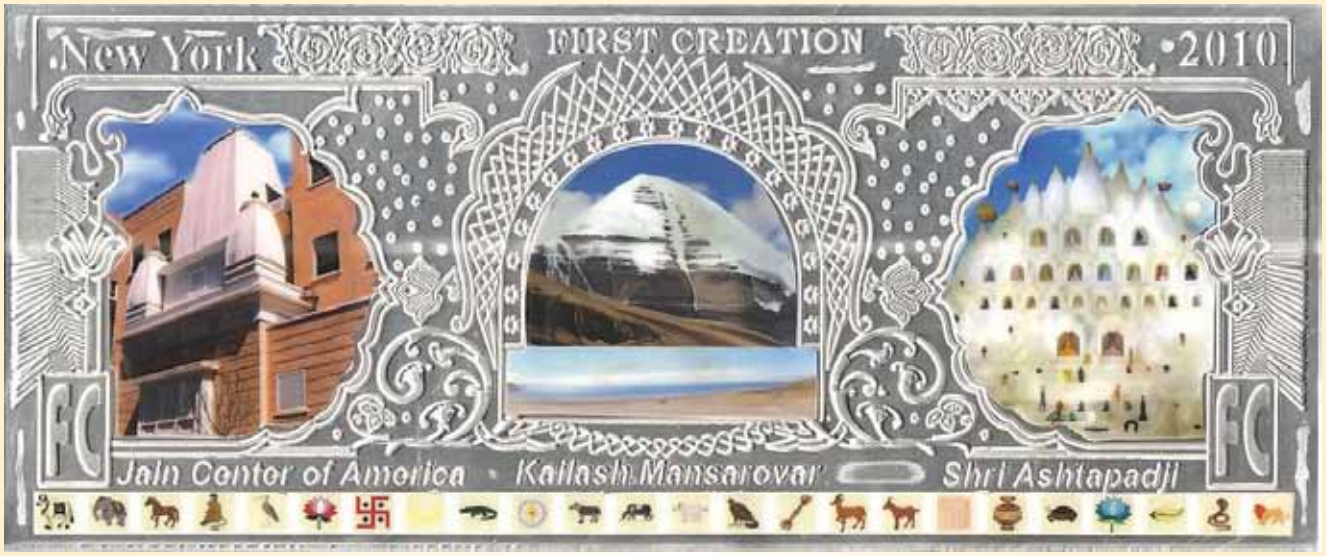
Dr. Niranjana Shah

with Regards

Shekhar & Purvi Shah
Priti & Atul Shah
Sonal & Amar Munsiff
Shilpa & Rahul Palawat

Gaurav & Heena Shah
Kavita & Nakul Bafana
Ankur & Aditi Shah
Atika & Bhavik Jhaveri

Silver Plated Bookmark Design and Sponsors



A Unity in Diversity

Ms. Alpa, Nirali & Neha Sanghavi
Smt. Dinaben Mukesh Ajmera
Smt. Manjuji Ashok Surana
Smt. Minaxiben Prakashbhai Gandhi
Smt. Mitaben Mehul Shah

With Best Compliments

Smt. Payalben Mayur Shah
Smt. Shantaben Surajmal Gandhi
Smt. Shushilaben Kantilal Shah
Smt. Ushaben Ajitbhai Vora
Smt. Vijayaba Mulchand Sheth Parivar

Members of all traditions contributed towards
Ashtapad research, Pratishtha and Granth.

DVD I and II

Both Ashtapad DVD's and the bag is sponsored by
Chameli Bai Sacheti and Family

Contributors for three research trips to Kailash Mansarovar

Research Trip I - 2006

- Ms. Jyotiben R. Gandhi
- Dr. Kiritbhai Gosalia
- Fine Gems (NY) Inc. - Sunilji Daga
- Ramesh S. Lakhani
- Ashi Diamonds - Sanjay Babu Pandya
- Right Solitaire Jewelry - Nareshbhai Shah
- Ms. Ulkaben Kothari
- Dr. Ashok Kumar Surana
- Ms. Sarojji Ajmera
- Dr. Rajnikant Shah
- A.G. Color
- Ms. Niranjana Shah

Research Trip II - 2007

- Dr. Dilipbhai S.
- Girishbhai Sanghvi
- Maya Jewels
- Chunilal G. Shah
- Gems Int'l of CA
- Pointers Inc. Harnishji Kasliwal
- Kothari & Co
- Dr. Rajnikant Shah
- Hemendrabhai Sheth

Research Trip III - 2009

- Ms. Niranjana Shah
- Deepankar Sogani
- Gyanchandji Baradia
- Daulatraj Singhvi
- Mukeshbhai Shah

Later Part of Research Work was coordinated in association with
Lalbhai Dalpatbhai Institute of Indology at Ahmedabad under the supervision of
Director, Shri Jitendrabhai Shah and assisted by Archanaben Parikh

Our thanks to all of them

Following members joined and helped in the research trips. Our thanks to all of them.

Research trip I- 2006

Standing from left to right:
Vimal Kumar Bordia
Dr. Lata Bothara
Umaji Boradia
Niranjana Shah
Dr. Rajnikant Shah
Yogeshbhai Kothari
Dr. Kirit P Gosalia
Bharatbhai Hansraj Shah

Sitting from left to right:
Dr. P.S Thakker
Dr. Jitendrabhai B.Shah
P. Mrigendravijayji M.S.
Abhay Kasliwal

Research Trip II- 2007

From Left to Right:

Yogeshbhai Kothari
Dr. P. S. Thakker
Bharatbhai Hansraj Shah
Abhay Kasliwal
Navin Juyal

Research Trip III- 2009

From Left to Right:

Sally Walkerman
John Bellezza
Dr. Alok Tripathi
Dr. P.S. Thakker
Dr. A.K. Verma

Preface to Granth II

Ashtapad Maha Tirth Granth Part II presents detailed research studies and field explorations conducted by Ashtapad Research International Foundation (ARIF) under the auspices of Jain Center of America, NY since 2005.

Bharat Hansraj Shah from Mumbai was on a quest for discovering and locating the most sacred archaeological monument - "Ashtapad Maha Tirth" which is believed to be located in the Tibetan region of Himalaya, an autonomous region of China since 1958. Bharat Shah visited this area on several occasions and made a detailed photographic survey of Mt. Kailash and its surroundings. Review of Nandi Hill facing Mt. Kailash with natural step like physiography surrounding it and apparent sculptures of various shapes such as lion, sages etc. made him more determined to look into this subject. Bharat Shah also presented his observations at a seminar organized by Indira Gandhi National Center for Arts (IGNCA), New Delhi, January 1999.

Dr. Rajnikant Shah of New York City, started a comprehensive literature review and paper studies. Subsequently, three successive field expeditions have been conducted under his guidance. The field research team comprised of scientists from various disciplines and Jain scholars. The scientific team included geologists, remote sensing experts, archaeologists and professional photographers/rock climbers. Valuable data has been gathered from these expeditions, which was subsequently reviewed in detail by all of those involved with this project and the data was presented at various seminars and discussed by the team.

Himalayan Region is considered to be the abode of Gods. Most of the eastern religious scriptures have described their final destination in this abode of Gods. Jainism has also described the Ashtapad Maha Tirth to be in the Tibetan Himalayas – the final resting place of Lord Rushabhdev. The monument of this Maha Tirth was believed to be built by his son King Bharat in this region near Mount Kailash and Lake Mansarovar at the height of about 14000 to 15000 feet. In order to locate this Maha Tirth, initially a comprehensive study consisting of review of religious text and consultation with various Acharyas was conducted by Dr. R. Shah and Bharat Shah. Subsequently, a preliminary expeditionary trip was made by the members of the research group who was accompanied by Muni Shree Mrigendravijayji M.S. The trip included a visit to Tibetan scholars and religious leaders at various monasteries from Lhasa to Mt. Kailash, reviewing ancient texts and visiting places that are of religious significance. The preliminary trip ended with outer *Parikrama* of Mt. Kailash and visiting various landmarks around Mt. Kailash and Darchen. Subsequent to this initial expedition, two additional expeditions were undertaken to find the truth about the various hypothesis and theories that were developed after literature review, analysis of satellite images and presentations and discussions by scholars during various seminars. Part I of Granth presents articles on Ashtapad from scripture and Part II of Granth presents scientific data pertaining to the Mt. Kailash area along with the summary of expeditions conducted to date.

Considerable literature has been devoted to geology as the team was trying to understand the role that the geological forces may have played in this land and physiography during

establishment and subsequent disappearance of Maha Tirth. Geologically, Himalayas are a part of the great arcuateorogenic (mountain building) belt extending west to east from Spain to Indonesia, which evolved as a result of repeated deformational activities and upheavals. This orogenic belt is situated between the two continental masses, the Indian Peninsular mass in the south and the Eurasian continental mass in the North. Initially the Tethys Sea (i.e., ancient sea that existed in place of the present day Himalayas) occupied this orogenic belt where a thick pile of sediments was deposited with remains of marine life. The sedimentary rocks such as shell, sandstones, conglomerates and numerous igneous intrusions of batholithic dimensions were recorded. Mount Kailash represents a huge batholithic (i.e., a large mass of igneous rock that intruded in the surrounding rock mass at great depths) granite mass in the shape of a "*Shivling*". The Peninsular Indian mass from south collided with the northern Eurasian mass at the collision zone known as the Indus Tsang Po suture zone, whereby elevating the Tibetan sedimentary mass to a height from 13000 ft and above. This is also popularly known as the "Roof of the World". Four major Rivers are flowing through this Suture Zone such as Indus flowing to the west and Tsang Po (Brahmaputra) to the east. The impact of this collision and continued movement of these continental masses is still evident today in form of earthquake tremors that are regularly observed in this region. North of the suture zone, in the Tibetan zone, numerous fossils embedded within the sedimentary rocks have been found which clearly indicate their marine origin and also indicate the specific climatic conditions prevailing at that time. Readers will be fascinated by the chapter on Tibetan Plateau, environment and climatic conditions. This area has also undergone many extreme glaciations (cold) and interglacial (warm) climatic changes. The project team studied these geological forces and its impact on possible disappearance of Maha Tirth; however; no definitive conclusions have been arrived at, to date.

The Himalayan belt is tectonically active and the constant movements are recorded especially on the E-W strike slip faults, and NE-SW oblique faults causing earthquakes. The details about Geology have been described in the articles of Heim and Gansser, Gansser, Navin Juyal and P.S. Thakker. Interesting physiographic features resembling human sages, bullocks, cows, lions, carved temples and step like structures in the mountains looking from faraway mistaken for some archaeological monuments. After close scrutiny they were found to be the natural rocks sculpted by natural erosional agents such as wind, running water, and glaciers that have shaped the rocks according to their hardness. More details are provided in the article of Juyal and Thakker. The extreme climatic conditions such as glacial and inter glacial periods, have affected the rocks and soils. Their contribution in evaluating the possibility of the human or animal survival and existence has been described.

Dr. Thakker's evaluation of high resolution satellite Imagery and remote sensing study of this region had aided in locating few potential sites that needed further close scrutiny by field geologists and archaeologists. Review of aerial photographs, topographic maps and satellite data lead him to conclude that the site presently known as Dharma King Norsang, located at southeast of Mt. Kailash may be the most probable site of Ashtapadji. The name of Dharma King Norsang literary translates as the place of Shiva or Aadinath. Dharma King means king of religion and Norsang means like a lion in human beings. The name of this place also

correlates well with the place for Ashtapad. It was recognized that a deep trench surrounds the Dharma King Norsang -probable Ashtapad site. The satellite data was also utilized in planning the last two field expeditions.

High resolution satellite images obtained from Geo Eye- IKONOS Data were evaluated by Shashikant Sharma in October 2009 and he prepared a 3D model of the region such that one can navigate and walk through the terrain using computer mouse.

The last field expedition was conducted under the leadership of Dr. Bellezza, a senior research fellow in Archaeology of Tibetan studies, from University of Virginia, USA, whose contribution is well known about the Zhang Zhung culture of Tibet. The readers can find interesting articles on Ancient Tibet and his report of the third Kailash Mansarovar field expedition.

All these three field expeditions have been conducted over the last five years and a large amount of data has been collected and analyzed. However, the results of the study are still inconclusive in confirming any archaeological signatures of Jainism or finding any Jainism artifacts that may confirm the presence of Ashtapad Maha Tirth in this region. Additional detailed study and field work will be required to continue this work. The Ashtapad Research International Foundation has also prepared a proposal to invite collaboration from scientific community and governmental agencies to assist in continuing this work further. The scientific community could assist in the archaeological, anthropological and philological methodologies and other possible multi-disciplinary scientific studies that could be conducted for this purpose and subsequently implement a research plan. The probable site can be visited by team of scientists, archaeologists, geologists and other experts to examine the probable sites and discern a most probable location on the basis of process of elimination. The research also should include studies of Bon-Po religion. Assistance from international institutions and help from the Chinese and Indian government and other institutions may also be necessary. Discovery of the archaeological site may also be helpful in shedding light on hypothesis that Tibet had a significant contribution to civilization and highlight the contribution of Rushabhdev who taught *Asi*, *Masi*, and *Krishi* to human beings as per Jain scriptures.

Mayur Desai &
Ajit Kumar Shah

From Editor's Desk

Jain Center of America Inc., New York, has constructed a new temple for worship and other religious activities in 2005. Since then JCA has been gifted with a replica of Shri Ashtapad Maha Tirth, sculpted from crystal and gemstones, which was installed at the center in 2010.

To learn more about Ashtapad a lot of literature was collected from scriptures and compiled in XX volumes. These articles are now being reviewed and a selection of 1000 pages is being printed in two parts. Part I contains articles from scriptures which has already been published, while part II which is related to Ashtapad research is being presented herewith.

The whole Granth is divided in ten chapters. Each chapter is preceded by a photo gallery related to that topic. A brief introduction to each chapter is as follows:

Chapter one contains "Introduction to Research." It deals with quest for finding Ashtapad and newer methods of tracing it. Dr. Narendra Bhandari, Dr. Keval K. Sharma and Dr. Rajmal Jain give an insight towards achieving that goal. Photo Gallery has photos about various views of Kailash.

Chapter two contains "Three field trip reports". Original studies were done by Bharat Hansraj Shah. His report and opinion with photos is presented first. Subsequently we organized three field trips under the banner of Jain Center of America, New York and later in coordination with the Lalbhai Dalpatbhai Institute of Indology at Ahmedabad. I have summarized the report on field trip one. P.S. Thakker discusses report on field trip two. Dr. John Bellezza gives in depth studies of third field trip while Dr. A.K. Verma discusses the Ashtapad Initiative. A map of the Kailash region is attached. We have given photos en-route to Kailash here.

Chapter three contains special research data using satellite imagery obtained from Geo Eye-IKONOS data. Dr. P.S. Thakker's report on possible sites of Ashtapad and walking tour of Kailash with satellite imaging (see video) by Shashikant Sharma are interesting. We have given pictures of probable sites- Ashtapad and Nandi.

Chapter four contains articles on archaeology. Dr. John Bellezza's article is on the Pre - Buddhist Archaeological sites found around Kailash. Tom Sever's article explains about Archaeological remote sensing. Photos of rocks and ruins found around Kailash are given here.

Chapter five contains articles on Geology. Mayur Desai and Ajit Shah's article throws light on this subject. A summary from articles of Dr. Augusto Gansser and K.S. Valdiya throws light on geological aspects of Himalayas. Studies done by Dr. Navin Juyal on rocks and sculptures in Kailash area is interesting to learn. Photos about Nature as a sculpture as observed in Kailash area are given here.

Chapter six contains articles on "climate and glaciers". Navin Juyal's article on glaciation around Mount Kailash is interesting. Bao Yang and Erwin Appel's article explains the details about climate, eco-system, and glacier fluctuations. Various photos of glaciers, rivers and lakes of Kailash area are given here.

Chapter seven contains a short summary about Tibet, its history, geography, climate, geology, culture and religion. A translation of Tibetan articles has some important information about

Shri Munisuvrat Swami. Two of the articles discuss Jain Dharma in Tibet. A report on Tibetan studies done by Dr. Thomas Parmar at Dharamshala is given here. It also includes a glossary of Tibetan words. Photos about Nature's beauty-Panoramic views of landscapes around Kailash area are given here.

Chapter eight contains articles on Bon-Po religion, its history and principles which were indigenous at that time before the arrival of Buddhism in Tibet. Dr. Prashant Dave's article compares Bon and Jain religion. Pictures of Religious places visited in Tibet and symbols used in Gompas and in daily life are given here.

Chapter nine has a concluding article by Sajjan Jain and Dr. R. Shah. A proposal for further research is being presented here after discussion with various team members. Photos of people of Tibet we saw or met on the way to Kailash are given here.

Chapter ten has a selected index with cross reference selected as per code F (Geology), H (History), K (Kailash), U (Research) and Z (Maps and Photos). Details about all the articles as it appeared in volume I to XX with chapter and page numbers are given. Photos of flora and fauna observed during the trip are given here. A timeline folded chart is given at the end of the chapter.

Granth name is printed on upper corner on left side and chapter name on right side while article name is printed on lower corner of all the pages. Page numbers appear at the bottom. Original references of the articles as they appear in the volumes are given at the bottom on the first page of that article – readers can always refer to the original DVD. Regarding the language of this Granth Part- II, it is mainly in English.

All the above material is presented in appx. 500 pages in this part two. Pages are printed on art paper with plenty of pictures and photos taken during the field trips by team members.

The cover page has photo of Mt. Kailash and the back cover has the JCA building elevation. Inside cover page (Front Astar) we have Kailash with Ashtapad and in the back (Back Astar) satellite image of Kailash area. Bookmark has Kailash Mansarovar photo, JCA building elevation and Ashtapad Tirth as installed at NY.

The Granth has a hard cover and it includes 2 DVDs, DVD one has all research related material compiled in XX volumes and Granth I and IIand power point presentations. Second DVD has six videos namely A) Ratna Mandir, B) Kailash Mansarovar, C) Granth I opening ceremony D) A special satellite imagery in 3-D video format, E) 18 Abhishek at Mumbai and F) Ashtapad Pratishtha at New York. Both these DVDs are placed in the pockets inside the hard back cover.

We have collected many articles from various sources. We have tried to provide original references from where the articles were collected. This will give the authenticity to the article. Some articles are presented as a whole, while in some only an abstract of the article which relates to the topic has been given. We have tried to clarify this in the beginning of each article. Hope the reader and the writer will excuse us for this.

We have tried to get permission from all the authors-publishers whose articles appear here. Some have confirmed and we are still awaiting some. We acknowledge with great honor and

pleasure and pay our respect to all the authors whose articles have been collected and compiled in XX volumes and specially those, whose articles have been selected and put together in this Granth. Copyright acknowledgements are given at the bottom of the first page of their articles.

Pujya Mrigendra Vijayji M.S. had joined us on our first trip and gave his blessings. We wish to pay our respect to Pujya Ganivarya Naypadmasagar M. S. Under his guidance we organized many exhibits and seminars. Pujya Roopchandraji M.S. has been to Kailash with another group and has performed pooja there. We wish to pay our respect to Bhai Shri Nalin Bhai who visited Kailash recently with his group. Our special thanks to Pujya Nirmal Sagarji, Pujya Charukeerti Bhattarakji and Pujya Manak Muniji for their blessings during the Granth I opening ceremony. We wish to pay our respect to Pujya Chitrabhanuji who always encouraged us to carry on the work on Ashtapad.

Many individuals have helped in collecting research related articles. Dr. Kumarpal Desai helped in collecting Ashtapad literature which was put together in XX volumes. Special thanks to Shri Pramesh Gandhi, Shri Bharat Hansraj Shah, Dr. Lata Bothra, Dr. Ajit Kumar Shah, Shri Mayur Desai, (Late) Dr. Kamal Sogani, Shri Vimal Bordia and all research team members and many other individuals whose list is endless.

We wish to thank our research team members- scholars and scientist's whose names appear along with sponsor's pages. Special thanks to Shri Jitendra Shah, Director at L.D. Institute of Indology and the staff where later part of research work was co-ordinated.

Many thanks to all the donors whose contributions have helped to organize all three research trips. Their names are given along with sponsor pages. We wish to thank all our sponsors whose generous donation has helped to print this Granth (both parts), DVDs and Bookmark.

We wish to thank members, Executive Committees and Board of Trustees (past and present) at Jain Center of America Inc., New York for granting us the permission to construct the temple and install Shri Ashtapad Maha Tirth with Shri Chovisi at JCA. They took responsibilities for printing both parts of the Granth under JCA banner.

Ashtapad Maha Tirth replica was carved and put together by Mohnot Brothers- Nareshji, Dineshji and Rakeshji of Mohnot Gems, Jaipur. My cousin Navin Shah has helped us all along in supervising the work at Jaipur.

Kailash Mansarovar video of our trip was edited and provided by Dr. Kirit Gosalia. Ratna Mandir video was provided by Dr. R Shah. Pratishtha video was provided by JCA and both videos were edited by Mr. Upendra Bhargav of Jaipur. Granth opening ceremony video was provided by Rajendra Bafana. Satellite Imagery was provided by Geo Eye and Indian space satellite and put together by P.S. Thakker and Shashikant Sharma. DVD was made available by Mr. Vijay Nahata of Kolkata. Bookmark was prepared by Mukesh Sharma and his team at Jaipur.

Our thanks to Rahul Jain and Ms. Sonali Daga who organized and put all the articles together and prepared and printed all the XX volumes at New York. At the same time we wish to thank Shri Vimal Bordia who took care of printing at Jaipur and mailing all the volumes. He also looked after Ashtapad research activity for last 10 years at Jaipur.

Our thanks to Naresh T. Shah for his help in preparing cross reference and in the selection of articles. He also helped in editing the Pratishtha video. Special thanks to Ms. Archana Parikh who constantly helped in preparing the index, editing the articles and proof-reading. She also looked after Ashtapad research activities at Ahmedabad and without whom we would have never completed the editing job. Thanks to Ms. Nirali Shah who helped all along in editing and proof reading. Mr. Snehal Shah helped in editing. Ms. Vidhi Chhabria, Ms. Akshita Palliwal and Ms. Pranali Shah have helped me all along the way in putting all the material together and finally this Granth in your hands.

Niranjana, my wife, has been my backbone. She took care of our family and supported me in every way possible, from trekking to Mt. Kailash in blistering cold to reading and correcting errors in papers. She has taken my passions and made them her own. It has been because of her care and concern that I have been able to finish this ten year endeavor. I would like to thank my family members who remained patient with me during this period.

We wish to thank Shri Shailesh Desai and Girish Koshti from Hi Scan Printing for composing, printing and taking special care to print the photographs in the Granth.

Different research team members have expressed their own views and opinions about their work. One may agree or disagree with the views or opinion of the authors. It is a part of ongoing research and is incomplete and inconclusive as of today. Unless proved otherwise, the Ashtapad Tirth is lost (*lupt*) in time.

I have requested the research team members to work in coordination with L.D. Institute of Indology at Ahmedabad to continue the research work and follow it up till the lost Tirth is found.

Shri Aadinath era was the dawn of world civilization and once Ashtapad is located, it will tell us about early development of human civilization. This will open a new chapter on world history and will be a potential source of information about religion and culture of that period.

These two parts of the Ashtapad Granth is one of a kind. Literature on Ashtapad has never been compiled and for the first time a Granth has been written exclusively on Ashtapad research.

Jai Jinendra
Rajnikant Shah

Shri Aadinath - Varshi Tap Parna
Dated- April 24th, 2012, Vaishakh Sud Teej
Veer Samvat-2538, Vikram Samvat-2068

Note: Some of the reference books mentioned in this Granth including Shri Ashtapad Maha Tirth Granth I are available on JAINA e-library at http://www.jainlibrary.org/book.php?file=009772**. Granth II will be added soon after completion.**

Note: In 1986 a German expedition reached the sacred area around Mount Kailash and filmed a documentary of the ruins of buildings and fortresses from the kingdom of Shang Shung. This film was broadcast by some European television networks.

Reinhard Karl - The Dark Glow of the Mountains- Gasherbrum-Der Leuchtende Berg

One can view the film on the internet.

Foreword - Shri Ashtapad - Past, Present and Future

Kumarpal Desai

A rare & respectable research journey to locate Ashtapad (lost) Tirth on the basis of old scriptures and with the help of newer scientific methods

The research into Shri Ashtapad Maha Tirth has become an incredible history for the last twelve years. It's an incredible research work carried out on such a prehistoric subject. The idea of this research originated from a small incident, but with the passage of time the seed of this research grew into a huge fruitful tree. For this a lot of literature has been collected on Shri Ashtapad Tirth and compiled in XX different volumes. One Granth containing selected material from scriptures has already been published and this is the second Granth on it containing research material which is in your hands. A huge effort has been made to collect all the material from ancient manuscripts as well as from today's literature. To make an easy job for all researchers this material was compiled in two DVDs. Dr. Lata Bothra a scholar, has written a book "Ashtapad Yatra" on it.

In order to dig out the information from Tibetan literature Dr. Thomas Parmar went to Dharamshala and carried out a survey in all Tibetan libraries. Further three field trips have been organized in the Kailash area to look for Ashtapad. Archaeological and Satellite studies have been conducted to get some concrete evidences. All efforts have been made to locate this lost Tirth. Such a wonderful research work from all aspects has never been carried out ever before. So let's have a glimpse of this research done during the last twelve years.

Five main Tirth

Each religion has its own places of pilgrimage, similarly there are numerous places of Jain pilgrimage but five of them are the most important ones and hence are known as Maha Tirth and one of them is Ashtapad.

Out of these five Tirth, Sametshikhar is in Bihar in North India (presently in Jharkhand state). This is not the Nirvana bhoomi of one or two but twenty Tirthankar so it has its specific importance among the Jains. The other three i.e. Abu, Girnar and Shetrunjay are in Gujarat. The Delvada temples at Mt. Abu are famous all over world as a marvelous piece of art and architecture since the 11th century. Girnar is famous since the time of Mahabharat. It is the Nirvanbhumi of Bhagwan Neminath. Among these four mountains, Abu is on the highest peak. And lastly Shetrunjay- which is the greatest of all Tirth. Out of these five Maha Tirth only Ashtapad, presently does not exist which we are trying to locate.

Nirvan Kalyanak

The Jain scripture has singled out five central events (known as Pancha Kalyanak) that occur in a Tirthankar's life time as the most auspicious moments. First is Chayavan Kalyanak, second is Janma Kalyanak and third is Diksha Kalyanak. After very deep contemplation and meditation, the Tirthankar attains omniscience, Kevalgyan Kalyanak, -the fourth life- changing event. The last event is Nirvana Kalyanak, where the soul gets free from all karmic bonds and is liberated

to attain Siddha status. So this place is considered to be the most pious among all. There are five main Tirth where all twenty-four Tirthankars attained salvation as per following verse from scripture given below.

अष्टापदे श्री आदि जिनवर, वीर पावापुरी वरुं,
वासुपूज्य चंपानयर सिद्या, नेम रैवत गिरि वरुं ।
सम्मेत शिखरे वीस जिनवर मुक्ति पहुंच्या मुनिवरुं,
चउवीस जिनवर नित्य वंदु सयल संघ सुखकरुं ॥

Aadinath Bhagwan attained Nirvana at Ashtapad, Mahavir Swami at Pavapuri, Vasupujya Swami at Champapuri and Neminath Bhagwan attained Nirvana at Girnar. The other twenty Tirthankars attained Nirvana at Sametshikhar. I always bow with reverence to all the twenty four Tirthankars, which brings eternal happiness to all.

Thousands of years ago the first Tirthankar Bhagwan Rushabhdev attained Nirvana at Ashtapad. It is believed that it is somewhere among the snow-clad Himalayan peaks. Tirthankar Bhagwan Rushabhdev was the first to establish social code of governance and symbolized the importance of renunciation and penance, and attained Nirvana (final emancipation) at Ashtapad Mountain.

Once after attaining absolute knowledge, Shri Rushabhdev Bhagwan was delivering a sermon while seated in Samavasaran. Out of curiosity, King Bharat asked if any human being present here would become a Tirthankar in future. He replied affirmatively and said that his son Marichi will become the 24th Tirthankar after many life cycles and will be known as Mahavir. He subsequently explained the upcoming Chovisi (24 Tirthankars). This is how King Bharat came to know the details about the present Chovisi.

After his Nirvan, his son Bharat Chakravarti constructed a gemstone- studded palace in his memory on the Ashtapad Mountain. Twenty four idols of Jain Tirthankars were installed in it. It is believed that there are eight steps in the mountain to climb to reach the temple, hence it is known as Ashtapad. The Tirth is also referred to by such names as Ratnamay, Rajatadri, Sfatikachal in the scriptures.

The question arises- Where is Shri Ashtapad Maha Tirth today? Let us examine what scripture says and modern scholars and researchers think.

Collection of Literature on Ashtapad

Curiosity to learn about Ashtapad led us to study in depth the Jain and other scriptures – looking into ancient as well as present day material. The task of collecting material from scriptures and from various other sources started. All the collected literature was put together and published in XX volumes. All the material was collected from reliable sources. This was collected from old scriptures, books, travellers descriptions, researchers notes and from many other different sources.

This was a Herculean task of collecting all the available literature on Ashtapad. It took nearly 10 years and many people helped in the process.

On the other side details about Kailash and Mansarovar, Ashtapad and its geographic and geologic information were also collected. All the research related material including geo-scientific studies were put together. Information about modern scientific research tools as well as satellite studies were also put together.

As one was working on making a model – a replica of Ashtapad Tirth for the temple a lot of information regarding the construction of Ashtapad was collected to help and guide towards making of the mountain. Description of crystal and various gemstones was also collected to help carve the idols. The whole process of making of Ashtapad Tirth was discussed in detail.

Various stories related to Ashtapad Tirth were put together and were carved later on. Ashtapad Tirth Stutis, Stavans, Pooja etc were all collected and were put together. A master index with cross references was also prepared for ready reference.

Subsequently all these material contained in approximately 10,000 pages was put together in two DVDs – containing all the XX volumes. Finally a selection of about 10% of all this material collected was printed in the form of two Granths containing over 1000 pages.

Ashtapad related material was put together in Granth I containing details from scriptures and about the creation of Ashtapad Tirth. All research related material was put together in Granth II which included reports on the three field trips, geo-scientific studies, Satellite studies, tour photos and many more.

Ashtapad Tirth in Jain Scriptures

One finds the description of Ashtapad in many scripture books, Aagam literature, analytical books – Tirth Kalp, characters and stories and stavans from many Jain religious as well as from other religious books. One does not find any reference in the main Aang Aagam but one finds many references in scriptures written later regarding this Tirth.

1. Oldest reference is found in Avashyak Niryukti written by Acharya Shri Bhadra Bahu Swami. Here he discusses the Nirvana of Rushabhdev along with 10 thousand monks. Bharat Chakravarti built a temple at this place as per the notation.
2. Acharya Hari Bhadra Suri wrote a book- Avashyak Niryukti, where he discusses about the *Sinha Nishadhya Prasad* in detail. He also mentions about eight steps which were one Yojan (1 ½ mile) high.
3. According to the scripture Jain Aagam Shri Uttaradhyayan Sutra Niryukti which says anyone (Charam Shariri) who will travel to Ashtapad will get salvation (Chapter 10 Sutra 290). It describes Mt. Kailash as a gold and silver mountain.
4. Kalpa Sutra mentions Ashtapad as the Nirvana Bhoomi (place) of Bhagwan Rushabhdev.
5. Nishith Churni discusses salvation of Bhagwan Rushabhdev on Ashtapad Mountain.
6. One finds a chapter on Ashtapad Tirth in "Vividh Tirth Kalpa" written by Acharya Jin Prabha Suri. According to this writing Guru Gautam Swami entered *Sinha Nishadhya Prasad* from the south side.
7. In Shri Ashtapad Maha Tirth Kalpa written by Acharya Dharma Ghosh Suri one finds the description about this temple. It also mentions that *Sinha Nishadhya Prasad* was four sided or omni directional.
8. Detailed description about the construction of Ashtapad is found in "Gyan Prakash Deeparnave".

9. Bhagwan Mahavir while delivering a sermon, once said that one who would travel to Ashtapad to worship there, will get liberated in this life. 2600 years ago, one of his first disciples Shri Gautam Swami travelled to Ashtapad with the help of his special powers and stayed there overnight and worshipped there.

10. The 1st stanza of "Jag Chintamani Sutra" was written here on Ashtapad Tirth (Probodh Tika part 1). According to Shadavashyak Balavabodha, Gautam Swami performed "Chaitya Vandan" with the help of the 1st stanza of "Jag Chintamani Sutra" at this temple.

11. As per reference from "Vasudev Hindi" (21st chapter), this mountain is related to Vaitadhya Giri. It is eight mile high and the Niyadi River flows at the base of the valley.

12. As per Jambu Dweep Pragnapti, the Ashtapad Mountain is north of Koshal Desh. Indra Dev constructed three Stupas at the site of Nirvana of Bhagwan Rushabhdev.

13. As per references found from different scripture books, Ashtapad is 12.5 Yojan north of Ayodhya. One can see and have (Darshan) view of snow clad peaks of Ashtapad from a tree top on a clear day.

14. Siddhanam Buddhanam Sutra (Siddhastav Sutra) discusses the sitting arrangements of Tirthankar idols on Ashtapad as per the verse "*Chattari Aattha Das Doy Vandiya Jeenvara Chouvisam*".

15. Ashtapad Kalpa (old) written by Purvacharya mentions the importance of this Tirth and also discusses in detail about many good events that occurred here.

16. Kalikal Sarvaganya Acharya Hemachandracharya describes the Ashtapad Tirth in detail. In the 10th chapter it is mentioned that one who will climb Ashtapad Mountain with the help of divine powers and stays there overnight will get liberated.

17. As per Abhidhan Chintamani Mount Kailash is also called Rajatadri, Ashtapad, Sfatikachal, Haradri, Himvat and Dhavalgiri.

18. Digamber scriptures like Harivansh Puran, Aadi Puran, Uttar Puran also mention about Ashtapad.

Other references:

1. Pujya Sahajanand Dhanji wrote in his letters that 72 idols of the 3 Chovishi are buried here under the snow. He also mentioned that many Jain idols are with Buddhist monks.

2. According to a Mongolian monk, the first Tirthankar Rushabhdev worshipped and did penance here. One finds this description in the Kanjur and Tanjur books.

3. There are many old scriptures written on Tad Patra (Palm leaves) – which are there in Potala Palace in Tibet where it is mentioned that Rushabhdev attained Nirvana on Ashtapad.

4. Famous book Kangri Karchak, also known as the Tibetan Kailash Puran ,mentions that Kailash is the center of the whole universe.

5. Gangkare Teashi in his book 'White Kailash' wrote that Jains lived there before the arrival of the Buddhist people. They were known as Gyal Phal Pa and Chear Pu Pa. Their first

Bhagwan was known as Khyu Chok (Bhagwan Rishbhdev) and the last Bhagwan was known as Phel Wa (Mahavir Swami). According to this book many of their principles are similar to Jain principles.

Development of the Ashtapad Design for the Temple at Jain Center of America (NY)

How did Ashtapad look? One started thinking and imagining how it was constructed? Still not visible? How to create similar one now today? History of creating Ashtapad Tirth replica for Jain Center of America in New York was interesting and wonderful.

Our research resulted into following visualization of the actual Ashtapad: "Shri Ashtapad Tirth is situated in the tranquil region of the snow covered mountains of Himalayas and is open to the skies. It is known by several names such as Ratnamay- A palace made of gemstones and houses twenty four idols of Tirthankars made of gemstones, Rajatadri- Rajat Adri or Silver Mountain; because Ashtapad Mountain is snow covered and looks like silver, and Sfatikachal- Sfatik Achal: means a mountain of crystal". The above description helped in defining the attributes of the model of Ashtapad Tirth. To be able to replicate the real scenario, a mountain was carved out of crystal stone (naturally available in transparent and translucent shades) that could provide the look and feel of the snow-covered mountain.

Next Ashtapad is at a height on a mountain peak and open to sky under the clouds so one decided to put Ashtapad on fourth floor open to sky with a sky light and open windows to match original description.

Now as per the space available, design for Ashtapad was drawn. Crystal is heavy so flooring was reinforced and suitable frame was made to support the weight of crystal blocks.

Original Ashtapad was Omni-directional means four sided and idols were sitting in four different directions. Due to space constraint only a uni-directional unit was carved and idols were installed at four levels in one direction only- just matching the Ashtapad PAT seen at a Jaipur temple. One followed the same verse "*Chattari Aattha Das Doy Vandiya Jeenvara Chouvisam.*"

As per the description, idols were carved from gemstones and hence various colored gemstones were imported from all over the world and idols were carved accordingly. Each idol was carved from a single piece of rough without any joints as per religious measurements and no treatment so that it can be worshipped.

Some of the stones used are Amethyst, Citrine, Lapis, Ruby, Sapphire, Emerald, etc. It looks beautiful with twenty four different color idols on a white crystal mountain. At night with colors in the background it is totally different experience to look at it.

Total weight of mountain is ten tons with steel frame. There are 59 pieces of crystal blocks large and small- all put together and supported on a steel frame. Being a mountain an appropriate slope in the mountain from the front and sides has been provided. It is decorated with Kalash and Dhwaja at the top. It has a Kailash Mansarovar painting on the wall in the back and ceiling has faux painting to match the beauty of sky.

To install the idols on the mountain, suitable niches were hollowed out. Subsequently each niche was carved artistically with Astha Pratiharya design so as to provide fully religious setting.

They are 24 in all and they are of varying sizes, two are extra-large, four are large, eight are medium and ten are small. Each niche has two pillars a Chhajja and a Shikhar. Individual Yaksh and Yakshini are carved at the base of the niche. Chinha (Lanchhan) of each Tirthankar is carved at the base of the idol.

Gemologists and gem stone dealers will wonder at this piece of art work with so many different carved color gemstones at one place. Probably this is a one of the biggest pieces of art work carved from crystal and color gem stones. This all was done by the artisans and craftsmen at Jaipur.

There are many legends associated with Shri Ashtapad Maha Tirth, out of which twenty four have been depicted in individual carved units. These carvings depicting various stories related to Ashtapad were developed into separate three dimensional carved units. In which Janma Kalyanak, Varsi Tap Parna, Bharat Chakravarti, Areesa Mahal, Gautam Swami, Tapas Kheer Parna, Nag Kumar and Sagar's sons, Ravan and Bali muni, Ravan and Mandodari Bhakti, Rani Veermati and so on are sculpted beautifully (lively).

Till today there is no witness or evidence which tells us about Ashtapad but the Ashtapad Maha Tirth and Ratna Mandir at New York will inspire future researchers to undertake researches into Jainology, and the crystal gemstones will enkindle devotion in them.

Exhibits and Seminars

Many exhibitions of Ashtapad model and three Chovisi (72 Tirthankar idols) were carried out in many major cities all over the world. These exhibitions were carried out in Mumbai, Surat, New York, Palitana, Delhi, Kolkata, Ahmedabad, Chennai, New Jersey, (Jaina Convention), Los Angeles, Jaipur, Antwerp, and so on which created a great interest among people and researchers to know about this Maha Tirth.

On the way - Research

I had been writing occasionally about Shri Ashtapad Tirth in Gujarat Samachar – Akash Ni Aulakh and Parijatna Parisamvad columns. I explained the views of different researchers and scholars about their work and now let us discuss this further.

Jain Center of America Inc., New York was gifted with a replica of Ashtapad Tirth. This center is trying to locate Ashtapad Maha Tirth and Ashtapad Mountain. Three field trips were organized under the banner of JCA to visit and research the Kailash area from 2006 to 2009. The main objectives of these trips were to:

1. Add depth and breadth to the research already conducted.
2. Find the location/ existence of Ashtapad as described in scripture.
3. Prove the existence of Ashtapad geographically and archaeologically.

We get a lot of descriptions from the scriptures about this Tirth. Vividh Tirth Kalpa has Ashtapad Giri Kalpa in it, where description of Ashtapad is given. Similarly Acharya Shri Dharma Ghosh Suri gave a description of this Tirth in Shri Ashtapad Maha Tirth Kalpa.

There is a note about the construction of three Stupas by Indra Dev on Ashtapad in relation to

the Nirvana of Bhagwan Rushabhdev and King Bharat Chakravarti constructed a *Sinha Nishadhya Prasad* which is three Yojan high at the site of the Nirvana place with the help of Vardhaki Ratna using various gemstones. We also found information that they carved niches in the walls of the temple for the gemstone idols. There is also a description that they arranged sculptures of goddesses carved from ruby with different expressions and hence the temple resembled Mount Meru, decorated with the goddess sculptures.

After that an important detailed description is as follows-

They built robotic doormen (Dwarpal) molded from iron to prevent visitors from doing any harm to the temple and to maintain the divinity of the place. Because of these well-built mechanical doormen it became difficult for an ordinary man to visit the temple. King Bharat Chakravarti carved eight steps on the mountain itself and hence it became still more difficult to climb because of the height. It became like a high pillar. Each of the eight steps was one Yojan in height. And because of these 8 steps this mountain is now called Ashtapad – Ashta means eight and Pad means steps. This mountain is eight Yojan in height and because it is snow-clad it is called as Dhavalgiri. Kailash name is also popular. Mansarovar is nearby.

According to the Jain scriptures and stories a total of 108 people, including Bhagwan Rushabhdev and his 99 sons including Bahubali, attained Nirvana on this mountain at one time along with 60,000 monks after fasting for 6 days. Indra Dev constructed three Stupas there and King Bharat constructed *Sinha Nishadhya Prasad*.

There is another story. The 60,000 sons of King Sagar Chakravarti went to Ashtapad to pray and they dug a deep trench all around Ashtapad Mountain to protect the beautiful temple. Subsequently they brought the flow of River Ganges there. Later on this trench became wider and so ordinary people could not cross and the temple became inaccessible to them.

Bhagwan Mahavir once discussed the importance of this temple and said that if a person can visit this temple, he will be liberated in this life.

Shri Deepvijayji who wrote Ashtapad pooja mentioned that 'Kailash Shikhare Prabhuji Viraje'. Sahajanand Dhanji in his letters about his travel to the Himalayas wrote on 13th July, 1960 – Ashtapad is 158 miles away from Badrinath. It is known as Kailash. Three chovishi temple is buried here under the snow in Tibet. Similarly many Jain idols are under the control of Buddhist people. Further he writes in another letter that the original name of Ashtapad is Kailash. Digamber tradition still believes "Kailasaj"-born out of Kailash is Ashtapad, and it is 30 miles away from Mansarovar. At present this is under control of China and gemstones idols are buried in the snow. Similarly, 'Kailash is Ashtapad' is also found in many scripture books.

Hiralalji Dugar in his book, 'Madhya Asia and Punjab mein Jain Dharm ki Prachinta and Lokmat' wrote in his travel notes that Kailash is Ashtapad. Government Gazette also mentions Kailash Mansarovar as Ashtapad. According to Geeta Press, Gorakhpur, in the special edition of Kalyan says that Kailash is Ashtapad and is the Siddhakshetra. It is noted that there was a Jain temple there once upon a time which is now lost.

As per another opinion, Mount Kailash is Ashtapad in the Himalayan mountains. One can go

around Kailash Mountain and do 'Parikrama' but cannot climb up Kailash. It is difficult even for mountaineers and it is not permitted by the Government as well.

As per Jain scriptures, the description of Ashtapad itself proves that it is very difficult to reach there. There is a point to note that recently Arvind bhai Kamdar went to visit Potala Palace, the residence of the Dalai Lama in Lhasa on the way to Kailash Mansarovar. This Potala Palace is under Chinese control at present. There Lama Gyatse-a told him that in our Potala Palace there are many Jain manuscripts written on 'Tad Patra' (palm leaves) and he pointed to Kailash mountain and said that Bhagwan Rushabhdev attained Nirvana here.

Thus Kailash mountain is known as Bhagwan Rushabhdev's Nirvana place as per Tibetan Lamas. In Hindu religion Kailash Parvat is known as the abode of Lord Shiva. Tibetan people believe that it is abode of Lord Buddha. Mansarovar is mentioned at many places in various Jain scriptures that prove that people were familiar with the Mansarovar in older times.

Today this Kailash Mountain is 25 miles north of Mansarovar in Tibet. Tibetan people refer to it as Kang Rim Poche. Its peak is always covered with snow all year round. The surrounding air is very cold and stormy. It is impossible for an ordinary man to climb up here which was also mentioned in the old Jain scriptures. According to the Uttaradhan Sutra, in reference to difficulty in reaching Ashtapad, it says, if a person (Charam Shariri – with special divine powers) can climb Ashtapad Mountain he will be liberated in this life. This is mentioned in the 290th stanza in Chapter 10.

All these descriptions suggest that this Tirth was not an ordinary Tirth which people can visit regularly. Today also there is snow all around the mountain and it is even difficult to get close to the mountain. Most people view it from a distance of about 4 miles away. Shri Hiralal ji Dugar, wrote in his book after visiting Kailash, that this mountain looks like a 'Samavsaran'. Swami Pranavanandji stayed here for 2 years and according to his view from Hindu and Tibetan angle, this is the Kailash where the first Tirthankar attained Nirvana and this is known as Ashtapad. He has narrated his experiences in his book, 'Kailash and Mansarovar' written in English.

There is another mountain Nandi on the south side of Kailash. 'Nandi' means bullock in Hindi literature. Everyone knows that the 'Chinha' (Lanchhan) for Bhagwan Rushabhdev is bullock. Nandi is always in front of Lord Shiva, similarly Nandi finds a place in front of Rushabhdev.

There is another majestic mountain which is about 40 km away from Kailash and always covered with snow and is called Gurla Mandhata. The Mandhata were descendants of Sagar Chakravarti. Between Kailash and Gurla Mandhata mountains there is a big beautiful lake. It is called Raavan Taal. In Jain scriptures one comes across Raavan's description and his stories, especially Raavan Madodari music and dance, where he attained 'Tirthankar Pad'.

According to a Tibetan article, the 20th Tirthankar Munisuvrat Swami did penance at Kailash.

As per another description one can see the white peak of Ashtapad Mountain near the border of Ayodhya from a treetop on a clear day. Ayodhya is the birthplace of Bhagwan Rushabhdev. Can it be possible that there is a relation between the birthplace and the 'Nirvan Bhoomi'?

Someone with a special ability can reach Ashtapad. People who visit from far away appreciate the beauty and divinity of this place. The feeling of spirituality makes one feel happy and content and it is difficult to express that feeling in words. Meeting of the sky with the mountains and the clouds, this nature's beauty enhances the sanctity of the place and creates a spiritual atmosphere.

Kailash is the abode of Lord Shiva and Maha Vad Teras is Shivratri, while Aadinath's Nirvana day is Pos Vad Teras, which is the same day. This difference is due to difference in the Hindu and Gujarati calendar.

Regarding Ashtapad Tirth, we have received many articles and letters. Shri Pramesh Gandhi has written in his notes that according to Massachusetts Institute of Technology (MIT) human civilization first started in Tibet. This matches with Bhagwan Rushabhdev's 'Asi, Masi and Krishi'. It is possible that civilization started in Tibet after people were taught about agriculture and then they started migrating along the river banks.

Shri Pramesh Gandhi talks about his special experience during his Kailash trip with 90 year old Shri Ram baba. This Ram Baba was the person who did the last rites for the Gandhi family and was a respectable saint. He told that a mountain peak next to Kailash is Ashtapad.

Swami Pranavanandji visited Kailash about 35 times. He wrote in his book 'Kailash Mansarovar' that Kailash is Meru and it is also called Ashtapad. Editorial was written by Shri Jawaharlal Nehru.

It is wider at the bottom and gets smaller at the top, which Pramesh Gandhi had thought after looking at Ashtapad pictures. While looking at this mountain peak from a distance, there is a trench all around, as per description in the scriptures. Today also, it is very difficult to reach on this mountain peak.

We should give special thanks to Shri Bharat Hansraj Shah of Delhi, now residing in Mumbai, regarding the research work on Ashtapad. He made this his mission and visited Kailash over half a dozen times since 1993 and took many pictures of the area and the mountain. After a couple of years of studying all those pictures, he wrote that the description of Mount Nandi matches with the description given by Kalikal Sarvagnya Hemchandracharya in his book 'Trishasti Shalaka Purush Charitra'. After looking at these pictures it looks like there are large steps on this mountain which could be man-made and not natural and there are few carvings that appear like idols. From these pictures one can see ruins of the temple, niches and the sphinx.

Other researchers looking for Ashtapad Tirth believe that Kailash is not Ashtapad as Kailash mountain is a place where one cannot climb or do penance. It has to be a different place. In reference to this, Shri Jaswant Rai Busa, did a lot of research. He has expressed his opinion along with his comments. First of all the main point is that Kailash Mountain is a type of mountain that nobody can climb or stay there. Travel to Kailash is very hard and difficult. People travelling to Kailash go upto a height of 19800 feet at Dolma La Pass and then do pooja, stuti and worship Lord Shiva from this place.

Air at this altitude is very thin. The extreme cold and harsh weather condition does not allow anyone to stay there. There are certain plants which make people unconscious and others

which help revive people. According to Jaswant Rai Busa's opinion, Kailash is Mount Meru and Ashtapad is a separate mountain based on the fact that it is impossible to stay on Kailash and do penance.

From the banks of Lake Mansarovar at a distance of about 5-7 miles, there is another mountain called Ashtapad which is between 'Padma Had' (Mansarovar) and Kailash (Kang Rim Poche). At the base of this mountain land is flat and there is a possibility to stay and do penance. In the early mornings, one can view Kailash and Mansarovar from there.

Near Ashtapad Mountain, there are hot water springs. Air is little better there. The cold is not extreme and very little snow and the atmosphere is relatively clear. There is some space for living and to do agriculture. One could find some plants and pieces of wood from surroundings for cooking purposes. Looking at all these facts, it is possible that this is the place where Shri Rushabhdev attained Nirvana and could be the location for Ashtapad Tirth.

The atmosphere of this Ashtapad area is very peaceful. The difference between self and spirituality disappears here and you can feel the divinity of the place and the strength of penance. From his experience Shri Jaswant bhai notes that this is Ashtapad. He also mentions that one Mongolian monk with his family stayed there during Kailash Yatra. He did penance there and made a small residence as well. He also made a small Stupa of Shri Rushabhdev. According to him, Rushabhdev did penance at this place. This is also mentioned in the Kanjur and Tanjur books.

In the 11th century, famous tantric and poet, Jichun Milrepa (1038-1112) and his teacher Marpaye did penance here. In Hindu, Buddhist and Jain scriptures Kailash has been described as a divine place. God himself has described Kailash as spiritual abode. 'Meru Shikarinam Aham' - Himalaya is a divine land and there are many small and large Tirth. Tirth Meru has a special place which is Kailash and Lord Shiva resided at this sacred place.

The monk who wrote 'Atharva Veda' while praying to the Goddess Earth says that 'Mother Earth, your Himalaya Mountain and jungle are very pleasant to us'. According to Shrimad Bhagwat, chapter 4, Kailash is the best amongst mountains and the abode of Lord Shiva. People with special divinity and Gods live here and they do penance, yoga and worship there. As per Devi Bhagwat, Lord Shiva and Goddess Uma always reside here in this divine land.

Hindus believe that Kailash is Lord Shiva. Tibetan Buddhists believe Kailash as God and they do stuti and worship and feel great about that. As per Hindu scriptures, while describing Kailash, Kailash is a divine mountain which originated from the umbilical cord of Lord Vishnu and has different types of colorful minerals and metals.

As per Tibetan scriptures, Kangri Karchhak, this Kailash is the center of the human universe, a place of diamond, pearls, crystal and gold. It is the Roof of the World. It is the place of origin of four major rivers. It is the center of the whole universe. The peak of this mountain is very high and touches the sky. On one side at one place there is a 'Kalpa Vraksh'. The eastern part is made of crystal, south made of sapphire, western part is made of ruby and the north is made of gold. The mountain peak is covered with fragrant flowers and medicinal plants.

Many gods and goddesses live around Kailash. Lord of Kailash – Dem chog (Lord Shiva) and his wife Dorje Phang Mo (Parvati) both always stay here on Kailash.

Tibetan God Dem Chog and Goddess Dorje Phang Mo and according to the Hindu belief, Lord Shiva and Parvati are same. While describing the idol of Dem Chog it is said that the color is blue like the sky, having three eyes and he is covered with elephant skin. He carries in his hand small drum, trident, skull etc. His waist is covered with tiger skin.

Jains have a lot of devotion towards Kailash Mansarovar. Jain scriptures mention this as Ashtapad Tirth and worship. They also mention this as the Nirvana place of Bhagwan Rushabhdev. Hindu people believe that Rushabhdev is a reincarnation of Bhagwan Vishnu.

Probable Sites of Ashtapad

Kailash Mountain also known as Kang Rim poche is 168 miles north to Badrinath and 25 miles south to Kailash or north of Mansarovar up in the Himalayas. Between Mansarovar (Padma Had) and Kailash, about 5.7 miles North-East, is another mountain called Ashtapad. This mountain is 8 miles in height as per scriptures and is covered with white snow and hence known as Dhawalgiri. One can walk from Darchen after crossing about 15-20 mountain hills and one will reach there in four to six hours. Buddhist pilgrims call this mountain "Kang Siche."

We are trying to work with the satellite pictures so that one can locate any buried structure. Latest report from Mr. P.S. Thakker is being studied. (Ref Vol XI, Chapter 80, Article B, Pg 4973). The probable site of Ashtapad is located to the South East of Mt. Kailash (6638 m), which is 5996 m high. Mt. Kailash is known as to Kang Rinpoche/ Gang Ti-se. It is 5 km South East of Drira Phuk: 5 km of Dolma La. 7.5 km North West of Zutrul Phuk: 8 km north east of Gyandrag Monastery: 8.5 km North East of Serlung Gompa. 9 km North East of Darphoche/ Yam Dwar, or Moksha Dwar. It is 2.5 km to the east of 13 Drigung-Kagyu chorten: 2 km to the east of Serdung Chuksum La, or 2.5 km South West of Gangpo-Sanglam La. The site is easily approachable from Serdung Chuksum La or Gangpo Sanglam La.

Further Satellite studies suggest that there are ten possible sites where Ashtapad could have been buried. 1) Mount Kailash, 2) Bonari near Kailash, 3) Barkha plains, 4) Tarboche, 5) Nandi Parvat, 6) Mountain between Gyandrag monastery and Serlung Gompa, 7) Gyandrag or Gangta monastery and hillock to the north of it, 8) 13 Drigung at the base of Kailash, 9) Tri Netra or Gombo Phang or Mahakal, 10) Dharma King Norsang.

Dawn of world culture

To locate Shri Ashtapad Maha Tirth archaeologists and geologists have taken the help of modern technology. Sindhu River originates from this place from the Himalayas and passes through Ladakh, Kashmir and Pakistan and merges into the Arabian Sea. The oldest culture of the world was found along the Sindhu River. This research may help us to find the actual origin of civilization. If we can find the Nirvana place of Bhagwan Rushabhdev, along with the Stupas, temples etc, it will give us an insight into the past of Jain religion and Indian culture and world history. This research work is taking broader course and this may help us uncover valuable information regarding the past of Jain religion, Vedic culture and World civilization.

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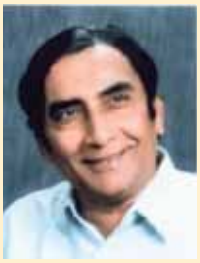

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Rajnikant Shah

SEE INNER FOLD OF THE BACK COVER

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Explanation of various abbreviations used in the Granth

Abbreviation	Explanation
^{14}C	Carbon (Dating)
A.D	After Christ Birth
AAR	Accumulation Area Ratio
ARIF	Ashtapad Research International Foundation
B.C	Before Christ Birth
B.P.	Before Present
bya (Ga ago)	Billion Years Ago
byr (Ga)	Billion Years
C.E	Common Era
CAF	Coalescing alluvial fans
CAS	Chinese Academy of Sciences
CRN	Cosmogenic Radio-Nuclide
DFG	A German Research Foundation
ELA	Equilibrium Line Altitude
GHz	Gigahertz
GPR	Ground Penetrating Radar
GPS	Ground Positioning System
IRS	Indian Remote-Sensing
ITP	Institute of Tibetan Plateau Research
ITSZ	Indus-Tsangpo Suture Zone
JCA	Jain Center of America
KMY	Kailash Mansarovar Yatra
KS	Kailash Stage
kya (ka ago)	Thousand Years Ago
kyr (ka)	Thousand Years
L.D. Inst.	Lalbhai Dalpatbhai Institute of Indology
LGM	Last Glacial Maximum
LIA	Little Ice Age
MBT	Main Boundary Thrust
MCT	Main Central Thrust
MFT	Main Frontal Thrust
MHz	Megahertz
MIS	Marine Isotopic Stage
MSL	Mean Sea Level
MWP	Medieval Warm Period
mya (Ma ago)	Million Years Ago
myr (Ma)	Million Years
SASM	South Asian Summer Monsoon
TiP	Tibetan Plateau

Chapter - 01

Introduction to Research

• Various views of Kailash	Photo Gallery
• The Quest for Ashtapad	Narendra Bhandari
• New Technique to discover Ashtapad Palace-Temple	Rajmal Jain
• Geological perspective at Kailash area in search for Ashtapad site	K. K. Sharma

Introduction

The main objective of the Ashtapad project is to locate the site and to find the ruins of Jain temple or palace built near Mt. Kailash by King Bharat - the son of Bhagwan Rushabhdev who was the first Jain Tirthankar. We do not know the exact period of the birth and *Nirvana* of Rushabhdev or when the temple was built or when it disappeared. Details from scriptures were presented in Ashtapad Granth I.

The articles in this chapter discuss the calculations carried out to determine the Rushabhdev era and to estimate as to how and when the temple disappeared. The calculations applied to date estimates that the Rushabhdev era existed around 14000 to 10000 years before present and temple may have been destroyed around 1550 AD due to glacial and seismic activity in the region and its ruins are now scattered and buried in the area. These above periods are based on assumptions and do not match with the religious scriptures. One should understand that we are using these assumptions for research purposes only until proved otherwise.

We are discussing the newer techniques that are being done using scientific methods. Advance new techniques were suggested and we tried to use them to locate and discover the temple site and its ruins, if any. Photo gallery provides various views of Kailash.

Photo Gallery

During the three field trips many photographs were taken by our team members. A selection of the photographs is presented in the beginning of each chapter for a quick visit to Kailash. They have been categorized with captions so that the reader can appreciate them. A folded Kailash area map as well as a Timeline chart has also been included.

Note: Abbreviations with explanations are given at the end of the Granth.

Various Views of Kailash

Kailash at Sunrise

Kailash- Step Design

Kailash with Kapala Tsho

Mount Kailash from the head of the west Serlung valley

Kailash - *View* from North

Snake hood shaped snow at Kailash peak

Kailash and Nandi Mountain as seen from the Serlung Gompa

The aerial view of Kailash and Nandi Mountain

Man-made cave and chortens at the base of Kailash

Kailash in Moonlight

Sun rays on Kailash - view from west side

First glimpse of Kailash from Mansarovar Lake

Southern face of Kailash with Nandi in front & a view of ceremonial ground with flags

Clouds covering majestic Mount Kailash peak in the afternoon

1 The Quest for Ashtapad

Narendra Bhandari

The Ashtapad Research International Foundation (ARIF), under the leadership of Dr. Rajnikant Shah, has been looking for physical evidences, based on descriptions given in scriptures to locate *Ashtapad Maha Tirth*, believed to be the *Nirvanasthal* of the first Jain *Tirthankar* Rushabhdev. I learnt about his efforts and the various difficulties in identifying Ashtapad several years ago when he wanted to find out if modern scientific techniques can help in this quest. Even to begin with, I realized that it is an extremely complex project and would require a multi-pronged attack to resolve. One approach would be to move future efforts from the domain of scriptures and belief to the domain of scientific enquiry. Even for a small chance of success the scientific approach has to be clearly defined and this article is an attempt in that direction.

It is generally believed that Ashtapad is located in Mansarovar-Kailash region of Tibet, and some scholars think that Mt. Kailash itself is that sacred place. Also there is a mount, east of Kailash, which is known as Ashtapad (Figure 1) but a trip to that area will make one rethink because there are some other Sites which share the same name. The research under ARIF encompassed many aspects which started with the survey of Jain scriptures and other literature (forming the main content of Granth 1), but field expeditions did not result in any concrete evidence. In order to get some clues to this problem, we examine various evidences which can be obtained from scriptures, archaeological excavations, cultural, religious, climatic and geological history of Tibet and we discuss the possibility of a scientific study which can be undertaken to resolve this problem.

1. Clues from scriptures

Jain scriptures mention that *Rushabhdev* performed severe penances with his 99 sons, 8 grandsons and 10,000 munis attained *Nirvana* at Ashtapad. After Rushabhdev's Nirvan, three *stupas* were built by *Indra* at the site of cremation of Rushabhdev, his sons and Munis. Later his son *Bharat* made a *Jin-Mandir* (memorial) in his honor known as "*Sinha Nishadhya*", so called because of its shape resembling "pose of sitting lion." The 24 idols were installed in four directions as per scripture, which is considered to be a typical Jain iconography. Its size is mentioned to be 1 *yojan* (about 15 km?) long, 2 *kosa*[1] deep and 3 *kosa* tall. It contained statues of Rushabhdev, his 99 sons and gem-idols of 24 *Tirthankars* (including Rushabhdev and the other 23 to be *Tirthankars*). Later iron guards (*Loh Purush*) were installed by Bharat to guard the memorial and he

1. There is much uncertainty in the measures of length and time units in Jain scriptures.

Ref. Vol. XVI Ch. 124 E Pg. 7277-7309

made eight one *Yojan* steps so that an ordinary man cannot climb, hence it is named as Ashtapad. Fearing some damage to the memorial by people and to make it impossible to reach the site, King Sagar's sons later on made a ditch all around the *Jin Mandir*. The 20th Tirthankar Munisuvrat Swami (supposed to be contemporaneous to Rama, circa 750-1500 B.C.)[2] is believed to have visited this site for penance. If so many persons inhabited the place or visited and carried out construction activity, some remnants must surely exist. The structure existed till about 2600 years ago since the most recent mention in the scriptures refer to the visit of *Gautam Swami* (a disciple of the 24th *Tirthankar Mahavir*, 600 B.C.). The problem can be resolved if we can find any proof for any of the structures, mentioned above, from field survey/excavation or satellite imagery. However it is also mentioned in some scriptures that the structure later on disappeared. What caused its disappearance is not clear but it could be some geologic event like seismic activity, flooding or human activity. Although one cannot be sure, there is no geologic evidence for a major earthquake in this area for the past 2600 years which could have totally destroyed the *Jin Mandir*. It was therefore thought useful to look for some of the structures mentioned above obtained by satellite borne remote sensing methods. Dr. P.S. Thakker and Dr. Shashikant Sharma carried out a detailed analysis of satellite images of the region with some probable clues. Three field expeditions to the Kailash Mansarovar area, under ARIF which included geologists, archaeologists, space scientists and other technical experts were carried out during the last few years and ten probable Sites (Fig. 2) were selected on the basis of the description given in the scriptures and satellite imagery and were studied. These included Mount Kailash, Nandi Hill, some religious Sites like Gompa and Monasteries etc. The study did not succeed in identifying Ashtapad, although based on these studies some Sites can be excluded.

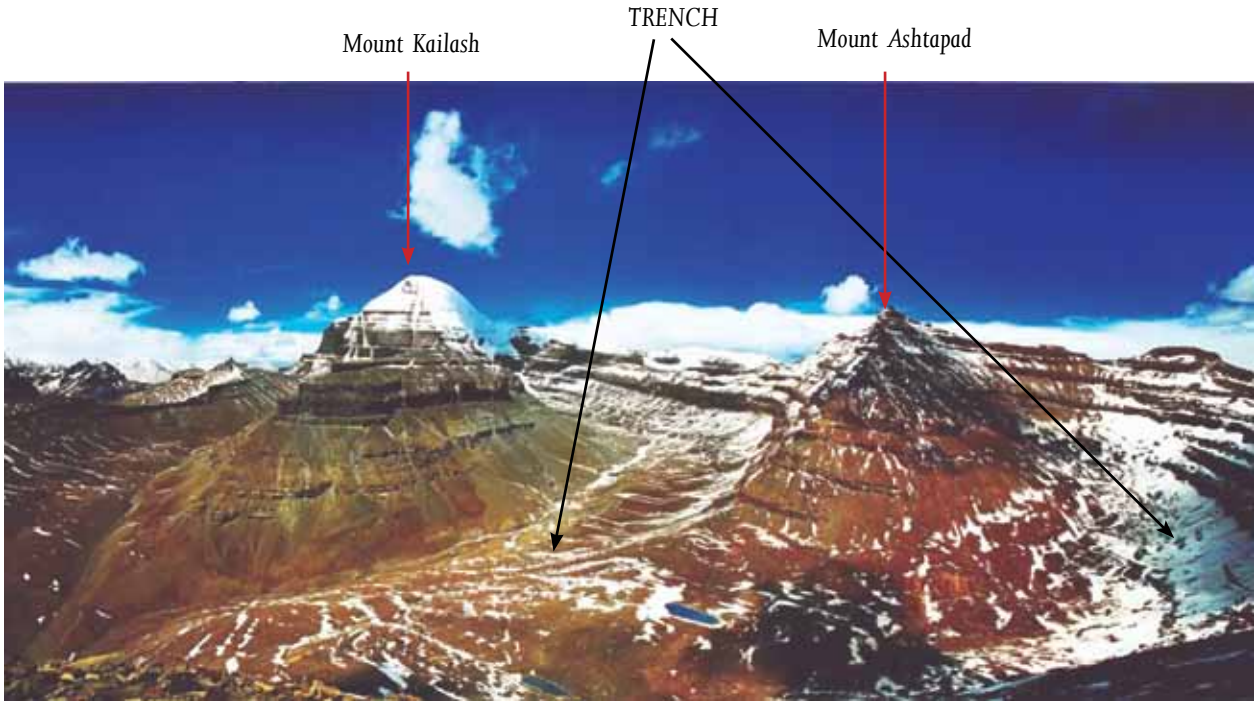
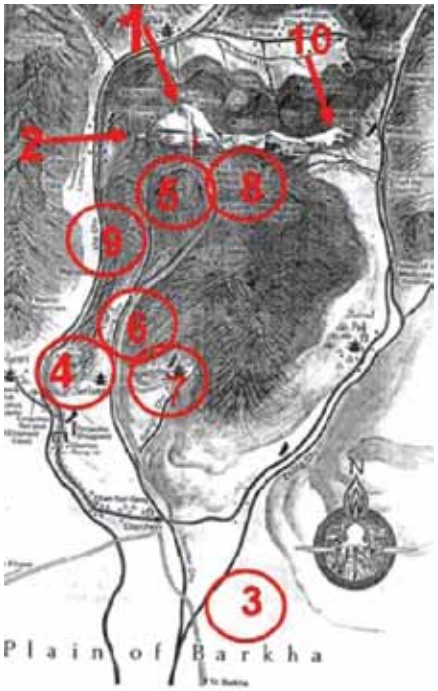


Fig.1: Mount Kailash and Mount Ashtapad

2. Based on age of pottery from the Ramayana site at Sringverpura dated by Thermoluminescence technique at Physical Research Laboratory, Ahmedabad (D.P. Agrawal, N. Bhandari, B.B. Lal and A.K. Singhvi, 1981)

Probable Sites of Ashtapad



1) Mount Kailash
2) Bonari near Kailash
3) Barkha plains
4) Tarboche
5) Nandi Parvat
6) Mountain between Serlung Gompa and Gyangdrag Monastery
7) Gyangdrag Monastery
8) 13 Drigung Kagyu Chorten,
9) Probable site of Ashtapad known as Gombo Phang or Trinetra or Mahakal
10) The site was detected using satellite data by Mr. P.S. Thakker and known as Dharma King Norsang.

Fig.2: Locations of potential Ashtapad Sites

2. Archaeological Evidence

a. Period of Rushabhdev

It is first necessary to have a rational estimate of the Rushabhdev's era (period) since the figures mentioned in the scriptures are difficult to understand. Rushabhdev was a very gifted king and he taught strategies of war, art (or script) and agriculture. Scriptures are replete with his praise as the inventor of "*asi, masi and krishi*", literally translated as swordsmanship, ink and agriculture. This is partly corroborated by the work of P. C. Roychoudhury (1956) who, based on archaeological excavations of Mohenjo-Daro, discussed below, puts the date of Rushabh at the end of Stone Age and the beginning of Agriculture age. If indeed these three traits of modern civilization were initiated by him then it is also archaeologically important and can serve as a milestone in the history and evolution of civilized society. Advent of agriculture is therefore an important time marker and we will discuss it below. Frequent travels of Bharat and Rushabhdev back and forth from Vinita (believed to be modern day Ayodhya, in Uttar Pradesh) to Ashtapad and the route they took also needs some explanation since we do not wish to resort to their supernatural powers. In this discussion we should, therefore, bear in mind the various elements of uncertainty, for example, in geographical references in the scriptures, whether there was another, now forgotten town of Ayodhya in Tibet or Ashtapad was a small mount outside the present day Ayodhya. This doubt can be partly clarified if some Jain artifacts are found in Tibet as mentioned below.

b. Carbon-14 ages relevant to onset of agriculture age in India

We first discuss the evidence for initiation of agricultural activity in India. Age of grains found at various archaeological Sites can be determined using the highly precise carbon-14 dating

method. Several Indian Sites have been dated largely due to the efforts of my colleagues at Physical Research Laboratory, Ahmedabad, and they generally group around 3000 years Before Present (B.P.) in Bihar region to 4500 years B.P. in peninsular India. The one exception of the oldest wheat found in India, so far, is in Lahura Dewa (Uttar Pradesh) estimated by M.G. Yadava and others (Unpublished, personal communication) to be around 10,300- 11,100 B.P. Subject to its confirmation and considering that even older dates may be found in future, we can say that the reign of Rushabhdev pre-dated 11000 B.P. There is some evidence that paddy growing pre-dated wheat cultivation and much older grains have been found in China. These ages will put further constraints on the initiation of agriculture in India and its neighboring countries.

A hearth found in the central Tibet has been dated. Several hand and foot prints imprinted on soft calcareous travertines are estimated to be 20,000 years indicating evidence of human activity in this area and that the last glaciations did not cover the entire Tibetan Plateau (Zhang et al, Current Science 2003).

3. Antiquity of Jainism

Rushabhdev was the founder of Jainism and the first Tirthankar. We can therefore look for the earliest evidence of Jainism in India. Much work has been done on Mohenjo-Daro and other Harappan Sites and we make an attempt to summarize them here. Mention may be made of some modern historians like Ram Prasad Chanda, Dr. Vilas Sangave, Dr. Heinrich Zimmer, John Marshall, Thomas McEvilley and Mircea Eliade who in their works link Rushabhdev and Indus valley civilization based on Terracotta seals and other evidences found in excavations. For example, Ram Prasad Chanda, who supervised Indus valley Civilization excavations, states in his article "Mohenjo-Daro: Sindh 5000 Years Ago" in Modern Review (1932) that the seated deities scribed on some of the Indus seals are in yogic posture and the standing deities on the seals show the typical *Kayotsarga* (a standing or sitting posture of meditation) position. In the Adi Purana Book XVIII, the *Kayotsarga* posture is described in reference to the penance of Rushabh. Christopher Key Chappel and Richard Lannoy mention that the Seal 420, unearthed at Mohenjo-Daro portrays a person with 3 or 4 faces.

Jain iconography frequently depicts its Tirthankars with four faces, symbolizing their missionary activities in all the four directions as was the case with the Jin Mandir memorial, built by Bharat at Ashtapad, mentioned above. Another seal depicts seven persons in upright position with arms hanging somewhat stiffly and held slightly away from the sides of the body which McEvilley correlates with the Jain *Kayotsarga* pose, the posture in which Rushabhdev is said to have acquired omniscience (*Keval Jnan*). Dr. Kashiprasad Jayaswal mentions that there is clear resemblance in naked idol carved in *Kayotsarga Mudra* in Harappa and one of the oldest idol of Mahavir. He claims that this idol is non-vedic and belongs to *Sramanic* or *Vratya* tradition, originally part of proto-Dravidian Brahmi, non-Sanskrit culture. Looking for archaeological/cultural evidence in south India, e.g. at Tamil Nadu. Dravidians even today worship *Arugar* (*Murugar*), also known as Aadinath (Rushabhdev) or Shiva. Thiruvalluvar, the famous poet saint, who lived around 1st Century B.C. quotes Rushabh in *Thirukural*. If this is indeed related to Rushabhdev then his influence had encompassed a large region, from Tibet to Tamil Nadu. This discussion thus shows that historically, the roots of Jainism are more of proto-Dravidian and pre-Vedic origin.

4. Jain icons in Kailash region

Fig.3: Jain icons and symbols seen en-route to Kailash Mansarovar

Another approach would be to look for typical Jain icons and symbols in Kailash Mansarovar region which will favor Rushabhdev's influence in Tibet. The common symbols used in Jain places of worship and houses are *swastik*, new moon with a circle above, *ashta mangal* and some animals (like bull, lion, deer related to various *Tirthankar's* etc). Many of these icons are found in many buildings in Kailash region as illustrated in Figure 3.

Some animals (deer, lion, tiger etc), not habituating in Tibet now a days, appear in many artifacts. These clearly point towards influence of Jainism in Tibet and Jain settlements there. Actually it is known that Tibetans practiced Bon Po religion, about 3000 years ago much before the times of Mahavir, which have much in common with Jain practices. The Bon religion was founded circa 1063 B.C., by a semi-legendary figure, Lord Shenrab Miwo and continued till the 8th century AD when Tibet embraced Buddhism. From this discussion we may conclude that Jain influence existed in terms of practices and icons in the Kailash Mansarovar region between 1063 B.C. and 8th century A.D. and exists in some form even today.

5. Climatic evidence and oldest human settlement in Tibet

We may also look at the available evidence in context of climate and human settlements in Tibet. It is found that when the climate is warm and hospitable, the civilizations develop and grow. From a global perspective, it is known that during the Last Glacial Maximum (LGM) when continents were connected by ice (more than 20,000 years ago) there is evidence of large scale human migration all over the earth. Genetic and genome evidence substantiates that Paleolithic population that existed in many places (Greenland to South India) have ancestral decendency from the African Man. Archaeological Sites of Palaeolithic (roughly 100,000 to 30,000 years B.P.) and Neolithic (~7000 years B.P.) culture existed in Tibet, including south Tibet, near Kailash. Recently human hand and foot prints have been found in hot spring travertines at an elevation of 4200 meters. Their age is estimated to be 20,000 years. Some foot prints are larger than expected of the present day habitants, indicating that another tribe may have lived there in those times.

From these studies we conclude that the oldest evidence of man in Tibet is dated at 30,000 years. A second phase of human occupation occurred during Neolithic period (early-mid Holocene). It is clear that the early hunters used Tibet area during warmer and wetter periods. Mid Holocene provided evidence of enlargement of areas favorable for grazing and agriculture.

This may be related to the advent of agriculture and the period of Rushabhdev discussed above. The climate is reflected in lake levels and record of agricultural activity may be preserved in pollens in the lake sediments. We discuss these aspects next.

a. Climatic record based on Lake levels and Glaciation

Three types of climatic data of Tibet are available for the past 40,000 years. Temperature (determined by oxygen isotopes in ice cores), thickness of ice sheets and inferred lake levels. For western Tibet such data are available for only 13000 years but may be related to overall Tibetan climate over longer periods of time.

During glaciations the lake levels decreased significantly. The work of Daut et al (2010) suggest several epochs of low lake levels going down by as much as 95 meters (compared to the present lake levels) in Lake Nam Co in Central Tibet. Except for a 10-15 meter decrease recently during the Little Ice Age, other low lake level epochs occurred prior to 10000 years. Some data suggest that higher lake levels existed between 40,000 and 30,000 years. It is likely that the first appearance of prehistoric man coincided with this period. S. K. Gupta (1992) studied the ice cap on the Tibetan plateau using oxygen isotopic data, which is a temperature index. They find a temperature decrease of 5 to 7 ° C during the Last Glacial Maximum (LGM) lowering the ice line by 700 to 1200 meters, covering much of the Tibetan Plateau. There is evidence of three periods of relatively high temperature during (i) 32-38,000 years, (ii) 24-28,000 years and (iii) 12000 years to present, resulting in higher lake levels, suitable for habitation and agricultural activity. The intervening period was very cold and ice thickness of the Tibetan Plateau was large. There is also evidence based on moraines that glaciers in Kailash region were more extensive in the past. Juyal et al (2011) based on their studies of geo-morphological observations around inner *Kora* of Mount Kailash suggest three distinct events of glaciation dating to pre LGM, LGM and mid Holocene era. Since then the ice volumes have been decreasing due to rise in summer temperatures and reduction of monsoon precipitation.

6. Future prospects

We have given an overview of various aspects, related to the problem of identifying Ashtapad, which includes, besides the references found in scriptures, archaeological, cultural and climatic data. All these patterns seem to be inter-related. Integrating all these data provides a broader perspective which underlines the complexity of the problem. These approaches may enable us first to define the period of Rushabhdev and then possibly help in locating the Ashtapad site. Further studies are important not only for the limited objective of locating Ashtapad but from global perspective related to cultural and climatic evolution in Tibet and their global context. The pioneering work and field expeditions carried out under ARIF has provided a basis on which we can design the future line of action. Although further field exploration and excavation is required which should include study of archaeological Sites en-route from Ayodhya to Kailash, Gompa and monasteries in the area, caves etc. which might have been inhabited by Jain monks for their penance and meditation. In addition, it may be useful to have a multi-thematic, multinational research study which may include (1) A multi pronged study of sediment cores taken from Lake Mansarovar, (2) Space based studies using high resolution remote sensing and (3) Ground based and space borne exploration using ground penetrating radar. We discuss the rationale of these studies here.

a. Study of sediment cores taken from Lake Mansarovar

Lake sediments are repositories of several types of activities in their catchment area. Firstly any agricultural activity or vegetation is preserved in form of pollens in the sediments deposited at the lake bottom and a sediment core can provide a time profile of different crops. Secondly climatic data can be obtained using proxy indicators like oxygen isotopes. Furthermore, any anthropological activity should leave some artifacts which will be ultimately deposited at the lake bottom and may show up in magnetic susceptibility profile. Therefore lake sediments may be useful in getting some precise information.

We therefore propose that long cores, going back to about 20000 to 30000 years may be taken from the Mansarovar Lake for the studies mentioned above. They will provide an opportunity for reconstructing and comparing the climatic record of Tibet with the global record, for example in Alpine Europe. The Mansarovar Lake is actually shrinking in size over time because of high sedimentation near its shore. To start with some cores from the filled region near the shore can be used for such a study. To convert the data to time profile, we have to first determine the sedimentation rate for which several techniques based on radioactive isotopes (for example lead-210) exist. The sedimentation rate depends on the distance from the shore and therefore the rate of deposition has to be determined at several locations. The best location where the core will represent long period of deposition will be from the middle of lake. Techniques exist for retrieving long cores. A rough estimate is that 10 meters deep core may take us 15 to 20,000 years back.

Past climatic records of Tibet is currently a prime area of interest in view of global warming and climate change and therefore many scientists from different countries may be interested in such a study. Therefore it may be best to have an international collaboration. A United Nations agency may be best suited for such a program.The International Geologic Correlation Program (IGCP) under the United Nations is one promising choice.

Fig.4: Sediment fill in the past shore line of Mansarovar Lake

In addition to pollen and oxygen isotopes, which is a proxy for temperature, other studies such as of magnetic susceptibility may be useful as an indicator for human activity.

b. Ground penetrating radar

Dr. Rajmal Jain of Physical Research Laboratory has pointed out in the seminar held at the L. D. Institute of Indology, Ahmedabad in 2010 that some structures (like *Jin Mandir*, mentioned above) can be imaged with a ground penetrating radar, if it has been buried at shallow depths due to seismic activity. High resolution studies can be made using ground based radar but satellite borne radar may provide a quick view of the whole region, although at a lower resolution.

7. Summary

In summary it appears that a multi pronged international effort using scientific techniques will not only be able to throw some light on this complex problem but would be useful in a wider global context of climate change. Such a study must be accompanied with field expeditions for other potential Sites in the area.

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2 New Techniques to discover Ashtapad Palace – Temple

Rajmal Jain

Abstract

This article is an outcome of continuation of research efforts started by a group of scholars and scientists under the guidance of Dr. Rajnikant Shah of Jain Center of America, New York, in locating the ancient Ashtapad Palace - Temple described in ancient Jain scriptures. Subsequent to a thorough review of the investigations carried out by Ashtapad Research International Foundation (ARIF) including three research expeditions conducted in 2006, 2007 and 2009 it has been realized that newer methods of research are crucial to break the deadlock. Based on the preliminary study, few probable locations have been narrowed down for further detail scientific study. However, in this article, I take a different look on the problem. My concept is to search the Ashtapad Temple firstly we should improve our knowledge about period of Bhagwan Rushabhdev and location and size of his Kingdom. Therefore, I reviewed the Jain scriptures and attempted to estimate the period of Bhagwan Rushabhdev and location of his Kaushal Kingdom. Further, in context to scientific aspects I also reviewed the existing records starting from the birth of the Earth, evolution of the Himalayan mountain range, onset of monsoon, evolution of man and climate cycle *etc*. Then I compared the findings from both Jain scriptures and scientific records, which are briefly presented in this article. I conclude that period of Bhagwan Rushabhdev is likely to be between 14000 to 10000 years before from present. I further describe the anthropological and geological changes in the Himalayan mountain range where the Ashtapad Temple is located and conclude that it is likely that the Ashtapad Temple is buried somewhere in the mountain. Therefore new methodologies are necessary to probe the temple. I propose new techniques that employ multi-frequency radio waves from ground based and space borne applications to look for the Ashtapad Palace - Temple.

1. Introduction

According to Jain scriptures, Bhagwan Rushabhdev is the first *Tirthankar* in the present Aara who set up a well disciplined civilization. In relevance to this fact he taught the principles of defense, art and agriculture. After establishing his Kingdom and teaching the people about civilization, Rushabhdev became a Monk, did penance on Ashtapad Mountain in Kailash, Tibet area and attained salvation there. His son king Bharat constructed a Temple/ palace with gemstones on Ashtapad Mountain as a memorial to commemorate the "Nirvan of Rushabhdev". The temple was omni directional that is four sided. According to scriptures, this temple was a major Jain Tirth and was described to be situated in the tranquil heights of snow covered Mt.

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Kailash region. The name Ashtapad is derived from the fact that there are eight (Ashta) Steps (Pad) leading to the Palace/Temple. The literature further describes that the descendants of Rushabhdev also made a trench around Ashtapad to protect it. At present, the exact location of Ashtapad is not known.

The scriptures further describes that about 2600 years ago, Gautam Swami, main disciple of Lord Mahavir, climbed, stayed overnight and worshipped at Ashtapad Mountain. If Ashtapad temple existed at that time, then the questions that need to be investigated are what happened to it during the subsequent period? How did it disappear? Could it have been destroyed either by forces of nature or by someone else or was it buried due to geological processes? The current article is an effort to address these questions as well as to explore the new techniques to locate the Ashtapad Temple.

2. Exploring the Period of Bhagwan Rushabhdev

Findings from the Existing Records

a. Jain Scriptures:

In order to achieve the goal of discovering the Ashtapad Palace - Temple, first we have to estimate the period of Bhagwan Rushabhdev. In this context, I attempt to fix the milestones to narrow down the period of Aadinath. So, firstly, let us look at the Jain scriptures related to period of Bhagwan Rushabhdev (Khyu Chok in Tibetan language), which suggest his period of birth, ruling, meditation and salvation was *koda-kodi* years ago from present. Currently according to Jain scholars, Acharyas, Muni Sadhus and Sadhvi Matajee the unit *koda-kodi* equals 10^7 X 10^7 ($=10^{14}$) years *i. e.* 10^5 times before the birth of the Earth. In Figure 1, a brief overview of period of Bhagwan Rushabhdev described in various Jain scriptures is presented.

Period of Bhagwan Rushabhdev (KHYU CHOK)	
Jain Scriptures	
• Period from Present: Koda-kodi (10^7 X 10^7 Years)	
• Birth : Falgun Krishna 8th; But year is not known !	
• Age	: 84 Lacs Purva
• Youth period	: 20 Lacs Purva
• Ruling Period	: 63 Lacs Purva
• Diksha Period	: 1 Lac Purva
• Chadmasthakaal (छद्मस्थकाल)	: 1000 Purva
• Height	: 500 Dhanushya

Fig.1: Brief summary of birth, period and height of Bhagwan Rushabhdev as described in the Jain scriptures.

It may be noted that his date of birth is given in the scriptures but year of birth has not been mentioned. Further, period of his age, youth, ruling, *Diksha etc.* has been presented in the unit of *Purva* and the height in the unit of *Dhanushya*. However, it appears that both unit *Purva* and *Dhanushya* were described much earlier, perhaps during the period of Bhagwan Mahavir, and later while using by individuals in last 200-500 years have been interpreted as per their own understanding. Even some Acharyas/Scholars have interpreted the unit *purva* as Purv (before). For example they referred the age of the Bhagwan Rushabhdev to be 84 lakh years purv, which, in fact, cannot be interpreted correctly in context to application of two units *viz.* years

and *purva*. Thus, in order to estimate the period of Rushabhdev, firstly we have to precisely define and understand the unit *purva* and *dhanushya*.

Ashtapad Research International Foundation (ARIF) has prepared several Granth volumes, and one of them from Shri Hemchandracharya M.S (~ 1100AD) as presented in Figure 2 suggests that Bhagwan Rushabhdev had been travelling all over for a period of one lakh years. Though the shlokas (sutras) of this Granth too do not throw any light on the period of Bhagwan Rushabhdev from present, but to some extent it gives an idea that he lived for at least one lakh years as a monk (*cf.* text in Figure 2). However, the shlokas of this Granth do not refer the unit *purva* and therefore the question of estimating the period of Bhagwan Rushabhdev still remains open.

Period of Bhagwan Rushabhdev

अह भगवं भवमहणो, पूव्वाणमणूणगं सयसहस्सं ।
अणउपुव्वीं विवहरीऊणं, पत्तो अठ्ठावयं सेलं ॥ ४३३ ॥

अठ्ठावयंमि सेले, चउदस भत्तेण सो महरिसीणं ।
दसहिं सहस्सेहिं समं, निव्वाणमणुत्तरं पत्तो ॥ ४३४ ॥

निव्वाणं चिइगागिई, जिणस्स इरवाग सेसयाणं च ।
सकहा थूभर जिणहरे, जाहग तेणाहि अम्मिति ॥ ४३५ ॥

अर्थात् संसार के दु:खो का अन्त करनेवाले भगवान ऋषभदेव संपूर्ण एक लाख वर्षो तक पृथ्वी पर विहार करके अनुक्रम अष्टापद पर्वत के ऊपर पहुंचे । वहाँ छ उपवास के पश्चात दस हजार मुनिगण के साथ निर्वाण को प्राप्त हुए । जहाँ भगवान ने निर्वाण प्राप्त किया था वहाँ देवो ने स्तूप बनाए और भरत चक्रवर्ती ने चोवीस तीर्थंकरों के वर्ण एवं परिमाण के समान सपरिकर मूर्तियां स्थापित की और जिन मंदिर बनाया ।

(Hemchandrasuriji M.S 1100AD)

Fig.2: Sutras 433-435 from the Granth of Shri Hemchandracharya Maharaj Sahab (~1100AD) suggests that Bhagwan Rushabhdev had been moving over the Earth for a period of 1 lakh years.

In this context we discussed the traditional historic unit *koda-kodi* with many old people, both intellectuals and common folk, including non-Jain and particularly tribal in Gujarat, Rajasthan, Uttar Pradesh and Madhya Pradesh. The outcome of the discussions was almost similar to that was taught to me in a Jain *Paathshala* during my childhood. The units of order of magnitudes in the past (perhaps until 2600 years before present) were defined as follows.

Koda=1000; Kode=100; Kodi=10

In fact we cannot say the above proposed units of magnitudes are very precise and correct, and the people were aware of such numbers because until 650 AD the 'zero' itself was not discovered. As we all are aware that Brahmagupta, around 650AD, was the first to formalize arithmetic operations using the 'zero'. Thus, on the other hand, the possibility of application of *koda-kodi* to interpret large number cannot be ignored. The number 1000 or more, of course, was very large number few hundred years back. In any case it appears that the unit *koda-kodi* requires appropriate defining with precise understanding. Meanwhile we proceed, considering that the above findings may lead us to the path of discovering Ashtapad. In the twenty-first century the 'zero' is so familiar that to talk about it seems like much ado about nothing. But it is the precise understanding and working with this 'nothing' that has allowed

civilization to progress. The development of zero across continents, centuries, and minds has made it one of the greatest accomplishments of human society.

However, we do not have any written old records before *Tirthankar* Mahavir's preaching. The early writing systems of the late 4000–3000 BC were not a sudden invention. Rather, they were a development based on earlier traditions of symbol systems that cannot be classified as proper writing, but have many characteristics strikingly similar to writing. These systems may be described as ***proto-writing***. They used ideographic and/or early mnemonic symbols to convey information yet were probably devoid of direct linguistic content. These systems emerged in the early Neolithic period, as early as the 7th millennium BC. Even after the Neolithic, several cultures have gone through a period of using systems of proto-writing as an intermediate stage before the adoption of proper writing. The **"Slavic runes"** (7th/8th century) mentioned by a few medieval authors may have used such a system.

In some states, the *kodi* is referred to be 20, perhaps due to economy inflation about 700 years before present during the period of Mohammad Tuglak (1325-1351 AD). It appears that these units of order of magnitudes had been extensively used by the common folk to represent the orders of period, money, goods *etc.* almost from 650AD. ***Thus considering the above units (koda-kodi) of orders of magnitude we infer that period of Bhagwan Rushabhdev may be between 10 and 20 thousand years from the present.*** On the other hand, it must also be noted that so far we do not have any convincing epic, document, record *etc*, which proves that ten thousand years before present the time was measured in hours, minutes and seconds as being done currently. Further back in time to almost several millions of years, in fact, the earth may not be having 24 hours in a day due to periodic nature of its own various motions. Thus, presently, in order to understand the unit *purva* of time we further considered to explore it since period of Bhagwan Mahavir. Again while discussing with old scholars and senior members of Jain and tribal community we found the following units and sub-units of time.

1 Day = 8 *Prahar* **(pahar), and 1** *Prahar* **= 4** *Purva* **(also called as Ghadi)**

Thus one day has a total 32 *purva* or ghadi. The measurement of *purva*/ghadi was based on the shadow cast by the standard object due to passage of the Sun or possibly by a Sun-dial system. The above important investigation enabled us to estimate the various periods of life profile of Bhagwan Rushabhdev as presented in Table I and also summarized in Figure 3.

Table I

Biography of Bhagwan Rushabhdev		
Age	84 Lakh Purva	~ 719 years
Youth period	20 Lakh Purva	~ 171 years
Ruling Period	63 Lakh Purva	~ 539 years
Diksha Period	1 Lakh Purva	~ 9 years
Chadmasthakaal	1000 Purva	~ one month

In addition to the units of magnitude and time, during the period of Bhagwan Mahavir (2650 years B. P.), the measurement of large-scale and small-scale distances as well as structure of the body, were probably being presented in cosmological and biological units respectively.

Period of Bhagwan Rushabhdev		
Period from Present: Koda-kodi years (10-20 thousand years)		
Magnitude scale:		
Koda = 1000 Kode = 100 Kodi = 10 (devaluation made kodi=20) (Mohammad Tuglak: 1325-1351 AD)		
1 Day = 8 Prahar (pahar); 1 Prahar = 4 Purva (Sun dial/shadow)		
Age	: 84 Lacs Purva	- 719 years
Youth period	: 20 Lacs Purva	- 171 years
Ruling Period	: 63 Lacs Purva	- 539 years
Diksha Period	: 1 Lac Purva	- 9 years
Chadmasthakaal	: 1000 Purva	- one month
Biological Scale:		
Dhanush: Spinal cord		- Dhanushya: cross-section of the vessel <5mm
Height: 500 Dhanushya		- 8.3 feet

Fig.3: Brief overview of biography of Bhagwan Rushabhdev in view of re-estimation done after considering the inputs from the folks regarding the units of measurement –i.e. time and height.

For example measurement of structure of the body such as height was being presented in *Dhanushya*. The *Dhanushya* perhaps had been adopted from biological scale because during those times the FPS (Foot Pound Second), CGS (Centimeter Gram Second) or MKS (Metre Kilogram Second) systems did not exist.

The *Dhanushya* is derived from the biological scale as follows.

Dhanush: Spinal cord, and the *Dhanushya*: cross-section of the vessel of the spinalcord ≤5mm.

This enables us to estimate the height of Bhagwan Rushabhdev (500 Dhanushya) to be ~8.3 feet (8 feet and 4 inches). The mean footprint (charan/ pagala) size of a man of height 5 feet and 6 inches is estimated to be 9 inches, which upon convolving over the height of Bhagwan Rushabhdev 8 feet and 4 inches may be estimated to be 14 inches. This is in agreement to the footprints seen in the Himalayan mountain range.

On the contrary, considering the traditional number of the Dhanushya often referred by Jain saints and/ or Jain scholars as 500 Dhanush, which is equal to 3000 feet (1 Dhanush = 6 feet), leads the footprint size of more than 400 feet, larger than footprint of Dinosaur, and therefore appears to be unreliable. Otherwise also for a man of 3000 feet height and standing on two legs it is unlikely to balance himself against natural forces exerted by gravity, wind, surface friction, and atmosphere in addition to the excess influence of solar radiation and greenhouse gases.

The above findings of period of Bhagwan Rushabhdev and his life profile appear to be closely related to the scientific evidences described below.

b) Scientific Aspects:

1. Evolution of Himalaya Range:

The foremost fact that should be considered in such investigations: Bhagwan Rushabhdev cannot be born before the evolution of the Earth. Thus my first milestone is to fix the evolution of the

Earth, Himalayan range and beginning of the monsoon *etc.* I present in Figure 4 the estimated periods, which have been now well-known from various discoveries made by geoscientists, paleo-climatologists and archaeologists. The Earth was born sometimes 4.54 billions of years (Ga) before present. Thus birth of Bhagwan Rushabhdev before 4.54 Ga is not likely. Further, the evolution of the Himalayan range took place about 60-55 million of years (Ma) before present as a consequence of collision of Asian and Indian plates. It may be noted that the current configuration of the Himalayan range was achieved sometimes 20 Ma years before present. However, the monsoon started only 10 Ma from present time. The brief summary of the Earth's evolution and the birth of the Himalayan range are presented in Figure 4 as ***"Fixing the Milestones - 1"***. In order for human life to evolve and survive, water has a vital role in general and in agriculture in particular. It has been very well established in Jain scriptures that Bhagwan Rushabhdev taught us Aasi (defense), Masi (art) and Krishi (agriculture). So we may conjecture a first-cut model that period of Bhagwan Rushabhdev might not be before 10 Ma in contrast to generally referred as *koda-kodi* (10^{14} years) in Jain scriptures. The life of mountain range has been estimated by scientists between 100 - 1000 Ma. Perhaps we might have not forgotten the large altitude peaks of Aravali and Vindhyachal mountain ranges that existed in the past and decayed over time. Currently they appear as very low altitude mountain series. This allows me on the scientific basis to conclude at this stage the period of Shri Rushabhdev to be less than 10 million years from now.

2. Human Evolution:

The word "*homo*", the name of the biological genus to which humans belongs is Latin for "human". The Latin "homo" derives from the Indo-European root, *dhghem*, or "earth".

The first debates about the nature of human evolution arose between Thomas Huxley and Richard Owen. Huxley argued for human evolution from apes by illustrating many of the similarities and differences between humans and apes and did so particularly in his 1863 book *Evidence as to Man's Place in Nature*. However, many of Darwin's early supporters (such as Alfred Russel Wallace and Charles Lyell) did not agree that the origin of the ***mental capacities and the moral sensibilities*** of humans could be explained by natural selection. Darwin applied the theory of ***evolution and sexual selection*** to humans when he published *The Descent of Man* in 1871.

Fixing the Milestones - 1	
The Age of the Earth	: 4.54 Ga B.P.
Evolution of Himalayan range ~	:
Collision of Indo-Australian and Asian Plates	: 55 Ma B.P.
Current configuration attained -	: 20-10Ma B.P.
Monsoon Started	: ~ 10 Ma B.P.
Life of Mountain Range ~	: 100 - 1000 Ma

Fig.4: Fixing the geological parameters- to estimate the period of Bhagwan Rushabhdev.

A major problem was the lack of fossil intermediaries. It was only in the 1920s that such fossils were discovered in Africa. In 1925, Raymond Dart described Australopithecus africanus. The type specimen was the Taung Child, an Australopithecine infant discovered in a cave. The child's remains were a remarkably well-preserved tiny skull and an endocranial cast

Ma-Million years • B. P.-Before present

of the individual's brain. Although the brain was small (410 cm^3), its shape was rounded, unlike that of chimpanzees and gorillas, and more like a modern human brain. Also, the specimen showed short canine teeth, and the position of the foramen magnum was evidence of bipedal locomotion. All of these traits convinced Dart that the Taung baby was a bipedal human ancestor, a transitional form between apes and humans.

The classification of humans and their relatives has changed considerably over time. The gracile Australopithecines are now thought to be ancestors of the genus *Homo*, the group to which modern humans belong. Both Australopithecines and *Homo sapiens* are part of the tribe Hominini. Recent data suggests Australopithecines were a diverse group and that *Australopithecines africanus* may not be a direct ancestor of modern humans. Reclassification of Australopithecines that originally were split into either gracile or robust varieties has put the latter into a family of its own, *Paranthropus*. Taxonomists place humans, Australopithecines and related species in the same family as other great apes, in the Hominidae.

Some people commonly assume that our species has evolved very little since prehistoric times. Yet, new studies using genetic information from population around the globe suggest that the pace of human evolution increased with the advent of agriculture and cities. If we are still evolving, what might our species look like in a millennium? Will we survive whatever environmental and social surprises are there for us? Speculation ranges from the hopeful to the dystopian. On the other hand, some people believed in the old science-fiction vision of a big-brained human with a high forehead and higher intellect (***a concept like Bhagwan Rushabhdev***). Others say humans are no longer evolving physically—that technology has put an end to the brutal logic of natural selection and that evolution is now purely cultural.

However, according to few scientists the big-brain vision has no real scientific basis. The fossil record of skull sizes over the past several thousand generations shows that our days of rapid increase in brain size are long over. Accordingly, most scientists a few years ago would have taken the view that human physical evolution has ceased. But DNA techniques, which probe genomes both present and past, have unleashed a revolution in studying the evolution. Not only has *Homo sapiens* been doing some major genetic reshuffling since our species formed, but the ***rate of human evolution*** may, if anything, have increased. In common with other organisms, we underwent the most dramatic changes in our body shape when our species first appeared, but we continue to show genetically induced changes to our physiology and perhaps to our behavior as well. Until fairly recently in our history, human races in various parts of the world were becoming more rather than less distinct. Even today the conditions of modern life could be driving changes to genes for certain behavioral traits. My foregoing discussion may lead you to ask many brainstorming questions such as follows and I hope they will not confuse you any further. If giant brains are not in store for us, then what is? Will we become larger or smaller, smarter or dumber? How will the emergence of new diseases and the rise in global temperature shape us? Will a new human species arise one day? Or does the future evolution of humanity lie not within our genes but within our technology, as we augment our brains and bodies with silicon and steel? Are we but the builders of the next dominant intelligence on the earth—the machines?

However, instead of getting confused let us further explore the human evolution to narrow down the birth of Bhagwan Rushabhdev. Tracking human evolution used to be the field

solely of paleontologists, those of us who study fossil bones from the ancient past. The human family, called the Hominidae, goes back at least seven million years to the appearance of a small proto-human called *Sahelanthropus tchadensis*. Since then, our family has had, a still disputed but rather diverse, number of new species in it—as many as nine that we know of and others surely still hidden in the notoriously poor hominid (biped primate) fossil record. Because early human skeletons rarely made it into sedimentary rocks before they were scavenged, this estimate changes from year to year as new discoveries and new interpretations of bones found from the past, make their way into print [see ***"Once We Were Not Alone,"*** by Ian Tattersall; *Scientific American*, January 2000, and ***"An Ancestor to Call Our Own,"*** by Kate Wong; *Scientific American*, January 2003].

The world's most famous fossil is of **Lucy**. At the time of her discovery, *Lucy* was the oldest known and best preserved early human ancestor (Johanson and Edey, 1984). In Figure 5, in order to fixing the next milestone, you may view the real fossilized remains of *Lucy*. However, there is evidence of the famed fossil ***Ida*** (an animal of Lizard type) who at 47 million-years-old is unbelievably well-preserved and provides a view into our primate past.

Nevertheless, the exploration of 6 million years of human evolution and the investigation of the 1974 unearthing of *Lucy* shook the scientific community and altered our understanding of human origins. The examination of the stunning 78 foot mural that depicts 6 million years of human evolution, over 100 cultural artifacts from Ethiopia, and *Lucy's* homeland suggest why Ethiopia is called the ***Cradle of Mankind***.

However, the fossil record tells us that the oldest member of our own species lived 195,000 years ago in what is now Ethiopia. From there it spread out across the globe. By 10,000 years ago modern humans had successfully colonized each of the continents save Antarctica, and adaptations to these many locales (among other evolutionary forces) led to what we loosely call races. Groups living in different places evidently retained just enough connections with one another to avoid evolving into separate species. With the globe fairly well covered, one might expect that the time for evolving was pretty much finished.

Fixing the Milestones - 2

• Human Evolution : Few million years

The discovery of Lucy brought back to 3.2 million years the human presence on earth. She was found in Ethiopia in November 1974.

Face to face with Lucy, the world's most famous fossil. At the time of her discovery, Lucy was the oldest known and best preserved early human ancestor. Height - 1.1 meter and Weight - 29 kg

Recent investigation shows that brain size is positively associated with intelligence in man and that this is the major reason for the increase in brain size of the hominids during the last 3-5 million years.

Fig.5: The real fossilized remains of Lucy (right). On left brief summary of Human evolution along with structure details of Lucy and the reason of increase in brain size are presented.

Nevertheless, the recent investigations reveal that the brain size of hominids has increased approximately threefold during the evolution of the hominids from *Australopithecus* to *Homo sapiens*. It is proposed that the principal reason for this increase is that larger brains conferred greater intelligence, and greater intelligence conferred a selection advantage. A number of anthropologists have difficulty accepting this thesis because they believe that brain size is not associated with intelligence in man. Evidence is reviewed, and new evidence from two studies further confirms that brain size as measured by head size is positively correlated with intelligence as measured by intelligence tests. It is considered that brain size is positively associated with intelligence in man and that this is the major reason for the increase in brain size of the hominids during the last 3.2 million years. ***Considering the trend of increasing brain size and intellect continuing over time we may address the question how during the period of Bhagwan Rushabhdev the man evolved with larger forehead (brain size) and the intellect sometimes around 10-20 thousand years before present.***

Thus based on human evolution and brain size versus intellect I may further narrow down the ***birth period of Bhagwan Rushabhdev between 3.2 Ma and 10000 years from now.*** I would also like to briefly mention again that forehead and physical structure of Bhagwan Rushabhdev described in previous section under Jain scriptures is also significantly larger and similar to what scientific evidences reveal.

3. Forces Influencing Earth's Climate

As shown in Figure 6, the climatic cycle over the Earth is governed mainly by five major forces *viz.* (1) Earth, (2) Geodynamics of Earth's Inner Core and Mantle, (3) Solar, (4) Cosmic Ray and (5) Greenhouse gases. The Earth Force reveals: a). 41 kyr axial tilt cycle, b). 100 kyr eccentricity cycle, c). 100 kyr equatorial plane oscillation with respect to the ecliptic, and d). 23 kyr cycle of the precession of the equinoxes. Among all five forces the Earth's force is

Climate Cycle

Major Climate Drivers

Earth Forcing :

a) 41 kyr axial tilt cycle
b) 100 kyr eccentricity cycle
c) 23 kyr cycle of the precession of the equinoxes

Geodynamics of Earth's Inner Core and Mantle:

a) Super-rotation and inner-core nutation
b) Super-plumes
c) Subducting
d) Tectonics plates and volcanoes

Solar Forcing :

a) 11 yr Solar Cycle
b) other solar cycles

Cosmic Ray Forcing :

a) Related to heliosphere and magnetosphere shielding
b) Only the high energy cosmic rays play a role

Greenhouse gases :

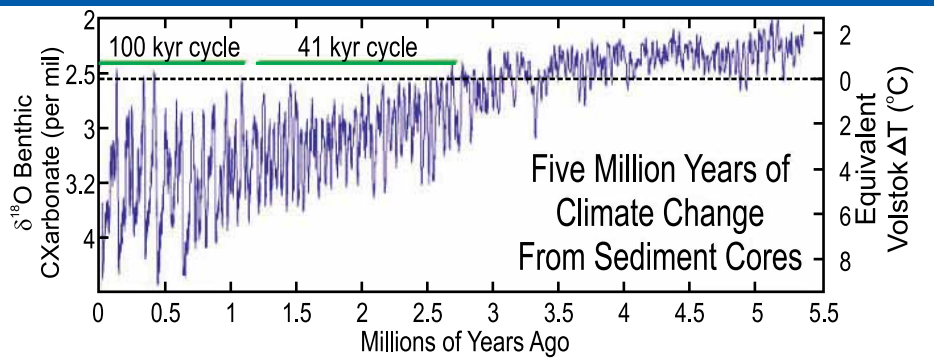
a) CO2
b) Methane
c) Water vapor

Fig.6: Major drivers of climate change over the Earth.

the strongest and has influenced the earth's geology, geophysics, environment, and hence the climate periodically, which in turn affected the human civilization, and perhaps almost all life cultures with low to high magnitudes at periodicities of the motion.

Shown in Figure 7, the next milestone fixing, are the fluctuating sequences of glacial and Inter-glacial periods during the last five million years revealed from the sediment records.

Fixing the Milestones - 3



Sediment records showing the fluctuating sequences of glacial and Inter-glacial periods during the last serveral million years.

Fig.7: Five million years of climatic change from sediment core. The O^{16} treatment on the Vostok ice core reveals Benthic Carbonate (left y-axis) and equivalent global air temperature (right y-axis) variations over the Earth.

The O^{18} treatment over Vostok Ice core sediment when observed in high time resolution then it revealed unambiguously the period of 100 thousand years of catastrophe on the Earth in terms of last glacier maximum (LGM). I am presenting, in Figure 8, the time series of about 425 thousand years to fixing next milestones - 4. The mean global air temperature (15^0 C) referred as 0 on the y-axis reaches to about -8^0 C on an average every 100 thousand years. Similarly, on the same time scale of 100 thousand years the mean temperature rises up to 3^0 C, which misleadingly has been interpreted as global warming by some of the climate scientists. Thus, in fact between LGM and warm phase time difference is about 50 thousand years. The last LGM occurred about 22 thousand years before present. Recent investigations of quaternary glaciation of Muztag Ata and Kongur Shan region have produced the evidence for glacier response to rapid climate changes throughout the Late Glacial and Holocene in westernmost Tibet (Seong *et al.*, 2009). Under the severe cold and arid conditions of the LGM, vegetation seriously degraded and forest retreated to the south and east margin of the Tibetan Plateau (Tang et al., 1998). According to Yafeng Shi (2002) glaciers fed by monsoonal precipitation are mainly located on the Tibetan Plateau and easternmost Asia. These are characterized by simultaneous accumulation and ablation (excision) in summer season. The southeast part of the Tibetan Plateau experiences monsoonal precipitation in excess of 1000 mm/yr resulting in maritime (seaborne) temperate glaciers. In contrast, precipitation in the middle and northwest part of the Tibet Plateau decreases from 1000 to 200 mm/yr, resulting in the formation of continental cold glaciers. During the last glacial period, the regions of heavy monsoonal precipitation were restricted to the southeast corner of the Plateau. The westerly weak precipitation zone shifted southward, and occupied the major northwest part of the Plateau, where the extreme continental type glaciers greatly expanded.

On the contrary, in the eastern margin of Asia including Taiwan, Central Japan, Hokkaido and probably Mount Changbai, maritime type glaciers were more extensive. The simple reason for this was the higher monsoonal precipitation, especially heavy snowfall in northwest Japan owing to the rich moisture content of the winter monsoon over the Japan Sea. The millennial scale monsoon intensity and glacial cycle in the Tibetan Plateau are strongly affected by the precession cycle and the orbit-inclination cycle (cf. Figure 6) which dominates the solar irradiance variation in low latitudes, as the high radiation and strong monsoon caused the warmer and wetter climate during 40–30 thousand years before present. The low radiation produced a weak monsoon and large depression of temperature and precipitation around 21 thousand years before today. This climatic pattern differs from that in the high latitudes where the eccentricity cycle is prominent. The temperature during the last glacial maximum (LGM) was 6–9^0 C lower than today on the Tibetan Plateau. Also the equilibrium line altitude was depressed by about 1000m in the southeast part, and in the east, south and west margins of the Plateau where precipitation was high. On the other hand, the equilibrium line altitude depression was 500–300m in the inner and especially in the west part of the Plateau. This variation in equilibrium lines might be caused by the combined effect of the decrease in precipitation, the expansion of extreme continental glaciers and the active uplift of glaciated mountains. The estimation of a glaciated area of about 350,000 km^2 in the Tibetan Plateau and roughly 500,000 km^2 in High Asia is based on the observations of prominent features of LGM glacier extension. However, these estimations may be the direct evidence that shows there was no Quaternary unified ice sheet developed in the Tibetan Plateau. The actual extent of the glaciated area during LGM in the Tibetan Plateau was calculated from the Quaternary glacial distribution map of Qinghai–Xizang (Tibet) Plateau at a scale of 1:3,000,000 (Li et al., 1991). **Considering that this small-scale map cannot exclude mid-latitude westerlies. However, shortly after 19000 years before present, drought was exacerbated, pollen content decreased and was dominated by Chenopodiaceae, and the lake water turned brackish. Around 17000 years before present the lake shrank and separated into some small lakes, resembling the present state (Li., 1998). Thus under the severe cold and arid conditions of the LGM, vegetation seriously degraded and forest retreated to the south and east margin of the Tibetan Plateau (Tang et al., 1998).** In summary, five shorter cold and warm stadial and inter-stadial cycles occurred during the last glacial and interglacial cycle in the low-latitude regions due to the tremendous influence of precessional and obliquity variables. According to the Guliya ice core records and the data from lacustrine deposits, and pollen records from the major part of the Tibetan Plateau, the summer monsoon was stronger, air temperature was higher and precipitation was abundant in the interstadial times. On the contrary, the winter monsoon was stronger, air temperature was low and precipitation was less in the past glacial stadials.

Thus current human civilization appears to be of less than 22 thousand years from present if we consider similar catastrophe occurred during last LGM. The greenhouse gas (CO_2) emission (green color in Figure 8) also reveals similar results. The records also reveal that the period from 850 to 630 Million year B. P. was most severe Ice Age in the Earth's history. The greenhouse gas CO_2 emission is a consequence of large volcano eruptions after the LGM.

Fixing the Milestones - 4

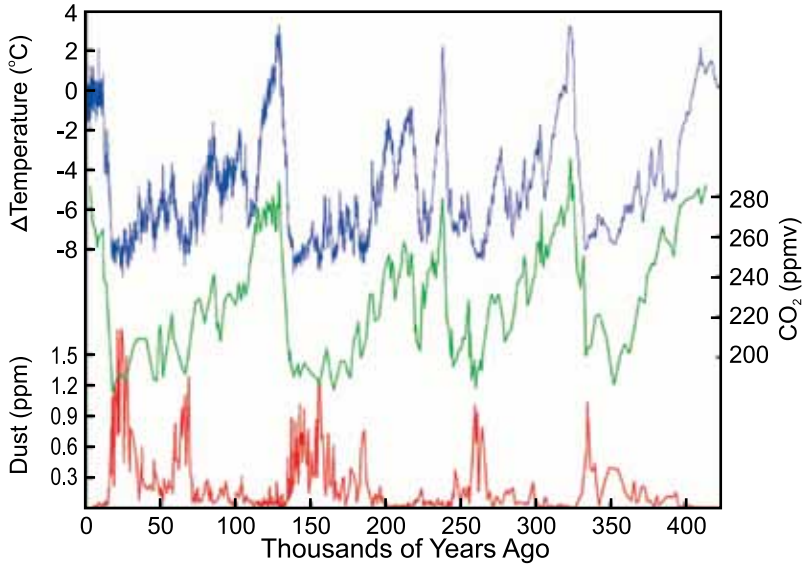


Fig.8: Climate change over the Earth in Four hundred fifty thousand years from present. The O^{16} treatment on the Vostok ice core reveals CO_2 greenhouse gas emission, (right y-axis) and equivalent global air temperature (left y-axis) variations over the Earth. The increase in CO_2 emission and hence enhancement in global air temperature is the consequence of volcano eruptions that often take place during long lasting glaciers.

On the other hand Geodynamics of Earth's Inner Core and Mantle forcing generates: a). super-rotation and inner-core nutation, b). super-plumes, c). Sub-ducting and d). plates volcanoes. In view of this force, the Earth has been observing significant variation in its super-rotation and nutation in last few millions of years, which results in several earthquakes and volcanoes in addition to wide climatic changes. One of the major forces affecting the Earth's climate in a variety of ways is the Solar Force, which has been well studied. Recent studies carried out at Physical Research Laboratory and over the globe show that the Sun is a major force to drive Space Weather and Space Climate, the two new emerging areas of research. The most striking and remarkable property of the Sun is the differential rotation, which along with its convection property produce sunspots. These sunspots have 11-year periodicity and are the major form of solar activity. The 80-year and 200-year periodicity of the solar activity is related to climate change over the Earth (Bhatt, Jain, Aggarwal, 2009). The 11-year, 80-year and 200-year periodicities may be well noted in Figure 8 as small fluctuations in long period time series. Nevertheless, in Figure 9 the sunspot cycle variation since 1700AD to present is shown along with predictions for the future sunspot maximum year and amplitude. However, it must be noted that sunspot activity periods may affect the climate cycle to significant extent but not to the extent of catastrophe on the Earth.

The other climate affecting forces are the Cosmic Ray Forcing, which is related to heliosphere and magnetosphere shielding; however, only the high energy cosmic rays play a role, and the Greenhouse gases: a) CO_2, b) Methane, c) Water vapor, and d) TPW (true-polar-wander).

Throughout history, the changing fortunes of human societies in Asia have been linked to variations in the precipitation resulting from seasonal monsoons. The variations in monsoon

climate over longer time scales also influenced the evolution of the world's highest mountain chain, the Himalaya. The climate over much of Asia is dominated by seasonal winds that carry moist air over the Pacific Ocean into East Asia and over the Indian Ocean into South Asia. The East and South Asian monsoons are responsible for most of the rainfall in these regions. Although the time when these monsoon patterns were first established is unknown, many lines of evidence suggest that they first came about at least 24 Ma. While it makes sense intuitively that heavy rainfall should be correlated with more aggressive erosion, it is important to see such direct evidence of the coupling between the processes that define the evolution of mountain ranges and climatic processes. It implies, once again, that Earth is a complex system, and we cannot begin to fully understand mountain building without appreciating the roles of the hydrosphere and atmosphere in the evolution of mountain ranges.

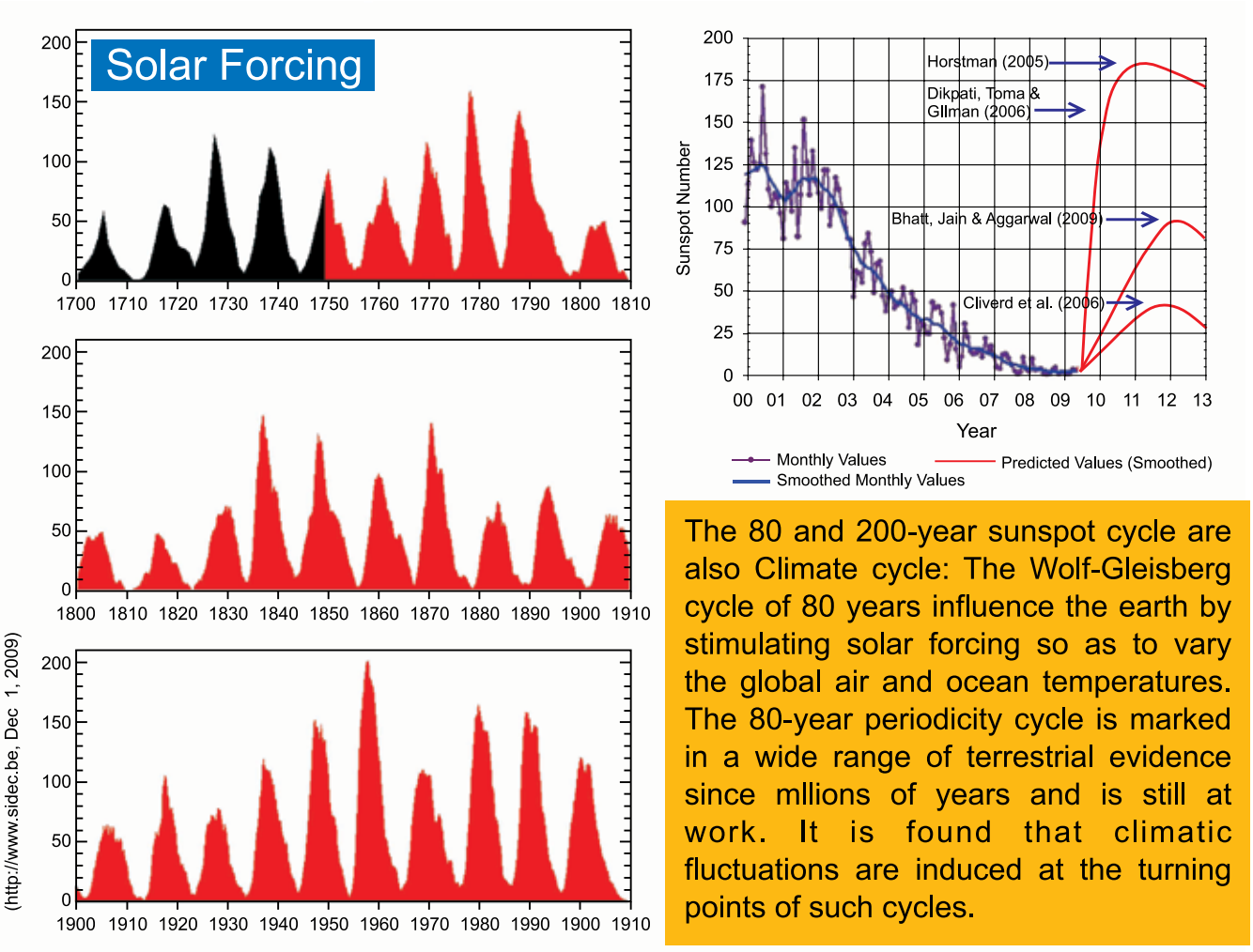


Fig.9: The sunspot cycle variation since 1700AD to present (left-side).
On the top right-side predictions for the future sunspot maximum year and amplitude are presented.
Bottom right-side briefs the relationship between the sunspot activity and the climate cycle on the Earth.

For ninety percent of the last million years, the normal state of the Earth's climate has been an ice age. Ice age last about 100,000 years, and are punctuated by short periods of warm climate, or inter-glacials (cf. Figure 7 and 8). The last ice age started about 114,000 years ago. It began

instantaneously. For a hundred-thousand years, temperatures fell and sheets of ice of more than kilometer thick grew to envelop much of North America, Europe and Asia. The ice age ended nearly as abruptly as it began. ***Between about 12,000 and 10,000 years ago, the temperature in Greenland rose more than 10°C.*** The climate of the ice ages is documented in the ice layers of Greenland and Antarctica. The ice-core of these layers has been extracted, and studied in the laboratory. Not only were ice ages colder than today, but the climates were considerably more variable. Compared to the norm of the last million years, our current climate is remarkably warm, stable and benign. The cold temperatures are detrimental for human welfare and warm temperatures are beneficial. From about 1500 to 1800 AD, the climate cooled slightly during a period known as the Little Ice Age. The oscillation between ice ages and interglacial periods is the dominant feature of Earth's climate for the last million years. Earth's climate is controlled by the Sun. In comparison, every other factor is trivial. The coldest part of the Little Ice Age during the latter half of the seventeenth century was marked by the nearly complete absence of sunspots.

We, therefore, in the context to climate variation over the Earth in the last few million years to very recent past, may narrow down the birth period of Bhagwan Rushabhdev to be between 12 and 10 thousand years from present, which is in close agreement to one koda-kodi period mentioned in Jain scriptures, however in view of my derivations described in earlier section.

3. Ashtapad Temple/ Palace

a) Mount Kailash:

Mt. Kailash is amazingly symmetrical striated pyramid at 7000 meters height. At about 36 kilometer to the south of Mt. Kailash lies Lake Mansarovar. Four great rivers of southeast Asia emanate from this lake. They are Sindhu, Brahmaputra, Sutlej and Karnali. Shown in the Figure 10 is the aerial view of Mount Kailash region and possible mountain site of the Ashtapad.

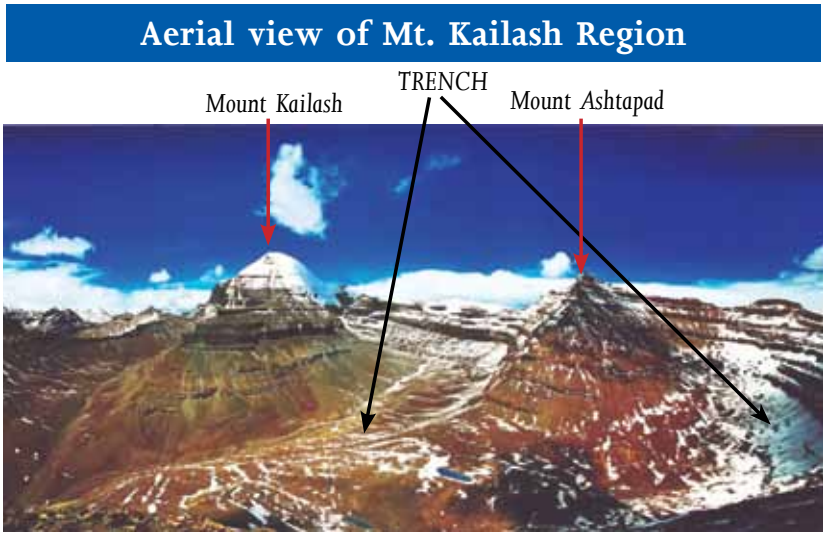


Fig.10: Aerial View of Mount Kailash region and possible mountain site of the Ashtapad.

In the area of western Tibet and around Himalayan border land, original indigenous religion (spiritual & cultural tradition) was called Bon Po which is supposed to be approximately 8000

years old or more and was contemporary with the Jain religion at that time. The MOINBA people numbering around 100 thousand practiced Bon Po religion. Many of the principles of the Bon Po are similar to Jain principles. Bon Po has specialized Shaman priests and Jain religion leaders were also called Shraman.

The Bon Po has influenced the religious and cultural developments of numerous people in Central Asia. Until about 7th to 8th century Bon Po was a predominant religious culture, over the extremely wide area of Central Asia. It represents the indigenous source of Tibetan culture.

Records of early history of Tibet and Han dynasty and the relationship between SHANG people and JIANS are interesting to note. Around 1400 BC there was a Semi Tibetan people called "JIAN" mixed with SHANG people. Tibetan people may be the descendent of "JIAN" also called JIAN Tibetan people. JIAN may be a synonym of JIN (Tirthankar), which means conqueror.

b) Geological Changes in the Himalayan Range:

In order to locate the Ashtapad Mountain, we must consider the geological changes occurred in the Himalayan range in last few thousand years from present. The great Himalayan mountain range formed as a result of collision of the Indian and Asian plates due to tectonic forces driving them towards each other about 60 million years (Ma) before present. The maximum elevation of a newly built topography primarily depends upon the equilibrium between the driving (compressive) and resisting (gravitational) force. However, the height of the topography also increases with the viscosity or the horizontal convergence. Further, the maximum topographic elevation is controlled by lithospheric rheology and thermal state. The high content in radiogenic nuclides in the crust leads to topographic upper limit. In Figure 11, therefore, I attempt to address the question - what sets up the maximum elevation of a topography? It may be noted that the maximum strength of the topography depends on frictional forces versus viscosity in the continental lithosphere. Based on current topography (Altiplano, Tibet), it may be assumed that for present time the maximum sustainable elevation is around 5 km (Lave and Avouac, 2000).

Lave and Avouac (2001) also investigated the pattern of fluvial (river related) incision across the Himalayas of central Nepal, which they estimated from the distribution of Holocene and Pleistocene terraces and from the geometry of modern channels along major rivers draining across the range. The terraces provide good constraints on incision rates across the Himalayan frontal folds (Sub-Himalaya or Siwaliks Hills) where rivers are forced to cut down into rising anticlines and have abandoned numerous strath terraces. Farther north and upstream, in the Lesser Himalaya, prominent fill terraces were deposited, probably during the late Pleistocene, and were subsequently incised. ***The amount of bedrock incision beneath the fill deposits is generally small, suggesting a slow rate of fluvial incision in the Lesser Himalaya. On the contrary, the terrace record is lost in the high range where the rivers are cutting steep gorges, which, in fact, is very important in understanding and estimating the steps formation of Ashtapad Mountain.*** However, to complement the terrace study, fluvial incision was also estimated by few investigators from the modern channel geometries using an estimate of the shear stress exerted by the flowing water at the bottom of the channel as a proxy for river incision rate. This approach allows quantification of the effect of variations in channel slope, width, and discharge on the incision rate of a river; the determination of incision rates requires an additional lithological calibration. Recent results reveal that the two

approaches show yield consistent when applied to the same reach or if incision profiles along nearby parallel reaches are compared. In the Sub-Himalaya, river incision is rapid, with values up to 10–15 mm/yr. ***It does not exceed a few millimeters per year in the Lesser Himalaya, and rises abruptly at the front of the high range to reach values of ~4–8 mm/yr within a 50-km-wide zone that coincides with the position of the highest Himalayan peaks, perhaps Mount Kailas and Mount Ashtapad***. Sediment yield derived from the measurement of suspended load in Himalayan river/s suggests that fluvial incision drives hill-slope denudation of the landscape at the scale of the whole range. The observed pattern of erosion is found to closely mimic uplift as predicted taking into account erosion and slip along the flat-ramp-flat geometry of the Main Himalayan Thrust fault (cf. Figure 11). The morphology of the range reflects a dynamic equilibrium between present-day tectonics and surface processes. The sharp relief together with the high uplift rates in the Higher Himalaya reflects thrusting over the mid-crustal ramp rather than an isostatic response to re-incision of the Tibetan Plateau driven by late Cenozoic climate change, or late Miocene reactivation of the Main Central Thrust.

Carretier et al., (2009) explored the extent to which it is possible to convert erosion rate data into uplift rate or erosion laws, using a landscape evolution model. Transient stages of topography and erosion rates of a block uplifting at a constant rate are investigated at different spatial scales, for a constant climate, and for various erosion laws and initial topographies. They identified three main model types for the evolution of the mountain-scale mean erosion rate. Observations of a mountain in the Gobi-Altay range in Mongolia support the exponential-type model. This suggests that the erosion of this mountain is either detachment-limited or transport-limited with a significant transport threshold. This study shows that drainage growth could explain differences in erosion rate measurements on different spatial scales in a catchment.

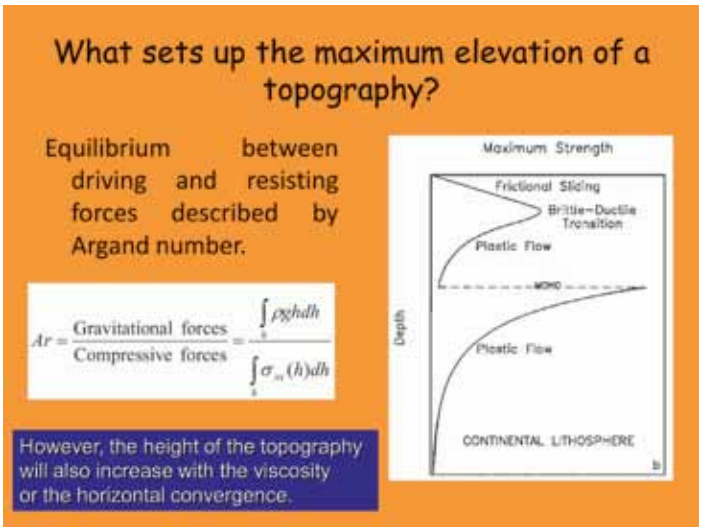


Fig.11: Illustration of dependence of elevation of newly built mountains. Left - the maximum elevation of a newly built topography primarily depends upon the equilibrium between the driving (compressive) and resisting (gravitational) force. It also increases with the viscosity or the horizontal convergence. Right - the maximum strength of the topography depends upon frictional forces versus viscosity in the continental lithosphere.

Shown in Figure 12 is the processed image of the world where the high altitudes on the Earth are presented by dark red color. The strongest dark red color may be noted above north-east part

of India, where the Himalayan mountain range is located with an altitude of more than 4 km. The Himalayan rage is remote from human interference and therefore negligible pollution may be seen in terms of emissions, effluents and electromagnetic radiation, which do not permit the light pollution as may be noted from Figure 13. It is above 40% of atmosphere and 90% of water vapor and aerosols (Beek et al., 2009). This makes the Himalayan range suitable for the study of various science disciplines including geology and astronomy (Prabhu and Anupama, 2010).

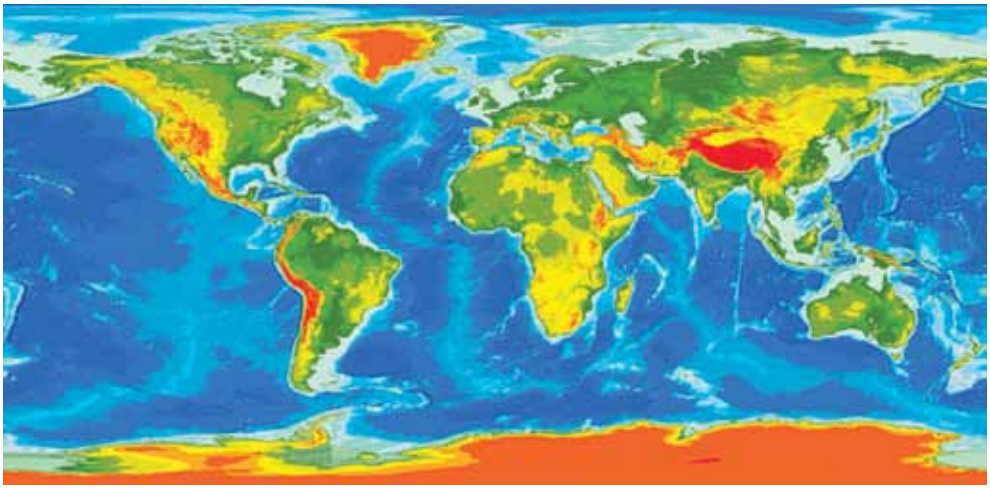


Fig.12: The processed image of the world where the high altitudes on the Earth are presented by dark red color. The strongest dark red color may be noted above north-east part of India where Himalayan range is located with an altitude of more than 4 km.

Fig.13: Light pollution map of the Earth. It may be noted that the Himalayan range is almost unpolluted.

Thus, now, in order to address the question of location and existence of the Ashtapad Temple, firstly we consider its period between 20 and 10 thousand years from present. In view that the Ashtapad Temple is currently not visible we may conjecture: (a) the temple got destructed due to heavy deposition of the ice sheets and/ or due to landscape, volcanoes, earthquakes *etc.*, and later during denudation the bits and pieces either spread over the mountain and nearby lakes or the temple penetrated/ pervaded/ buried into the mountain as a consequence of tectonics forces and further sunk due to gravity forces ; (b) the temple was attacked and destructed by human forces. Nevertheless, both models (a) and (b) should have left remnants/ ruins/ artifacts in the sub-surface to over the surface level, which, however, have not been found so far, neither by the scientists engaged in the geological/ archaeological/ anthropological

research nor by the teams of ARIF (Ashtapad Research International Foundation) who conducted recently three campaigns between 2006-2009. Nevertheless, recent investigations suggest that denudation rate is approximately 0.5 mm/year (Lavé and Avouac, 2001) to 5-10 mm/yr (Enkelmann et al., 2011), which restricts the increasing uplift due to various natural forces such as volcanoes, landscapes, pressure of ice sheets and earthquakes *etc*. In last several thousand years the Himalayan mountains have experienced almost all such natural and geological forces including severe climate changes, which, most likely, also might have affected the structure of the Ashtapad Temple. We may conclude in context to model (a) that due to denudation caused as a consequence of erosion and relief *etc*., described earlier, the temple's ruins/ artifacts flowed down forming the sediments and/ or buried into the sub-surface of the mountains or into the lakes. If the temple as a whole or ruins were buried in the Ashtapad Mountain about 10 thousand years before present then the ruins or artifacts might be at a depth between 5 and 50 meters. The possibility of model conjecture (b) also exists but the destruction by enemies or invaders is likely in less than one thousand years before present in view of description of existence of the Ashtapad temple in the Granth of Shri Hemchandracharya M. S. (~1100 AD). Next, even in this case also the ruins must be visible, which are not evident since last few hundreds of years. On the other hand, the history evidence that the Himalayan mountain range has experienced several climate changes in last several thousands to millions of years. During these climate changes in addition to denudation or pressure by the ice sheets the mountains have experienced several volcanoes, landscapes and earthquakes, which might have destroyed the Ashtapad temple/ palace, and the ruins/ artifacts penetrated/ pervaded into the mountain. Such an incidence, however allows the material to flow down instantaneously (few minutes to several hours) and the speed will be governed by pressure of the earthquake shock, gravity, friction forces exerted by the mountain inner surface, and thermal unbalance if volcano is the cause. We may estimate the depth of temple ruins as a function of the magnitude of these parameters and assuming that the ruins have not further penetrated significantly over the period of 10-20 thousand years. The simple estimate suggests that ruins may not exceed the depth of 50 meters. Probing to this depth or to larger extent caused by denudation is possible and we propose the application of radio waveband technique for this challenge in the next section. However, in view of description of the existence of the Ashtapad Temple in the Granth of Shri Hemchandracharya M. S. (~1100 AD), I would particularly like to mention very recent severe climate change during 1500 to 1800 AD known as ***"Little Ice Age"*** when several hundreds of people died in Europe, North America and around the world. Throughout the Little Ice Age, the world experienced heightened volcanic activity. When a volcano erupts, its ash reaches high into the atmosphere and can spread to cover the whole Earth. This ash cloud blocks out some of the incoming solar radiation, leading to worldwide cooling that can last up to few years after an eruption. Also emitted by eruptions is in the form of SO_2 gas. When this gas reaches the stratosphere it turns into sulphuric acid particles, which reflect the sun's rays, further reducing the amount of radiation reaching Earth's surface. Thus, it is likely that the Ashtapad temple could have been damaged during the first phase of the Little Ice Age in 1550 AD and followed up by the volcano eruptions which blew away the ruins to large distances and finally buried into the mountains or in the water.

4. Proposed Research Plan and New Techniques

Preliminary research has been done regarding the authenticity of both Rushabhdev and Mt. Ashtapad by eminent scholars and scientists from India and abroad. Teams of scientists and research scholars from various fields have also visited this area of Mt. Kailash in summer of 2006, 2007 and 2009 for preliminary reconnaissance survey. ARIF has prepared DVDs of findings of these field trips. In addition to the field trips, satellite data have also been critically examined to locate any possible sign of buried structure in Mt. Kailash region. The satellite data includes the images of IRS/LISS-IV (Indian Remote Sensing - Linear Imaging Self-Scanning System - IV) which was combined with the map of Mt. Kailash region (1:50000 scale), Published by Karto Atelier of Switzerland. The images of IKONOS and IRS satellite employing compatible software have also been critically studied to locate any possible buried structures in the Kailash area. Based on the campaigns, field trips and study of photos and satellite images ARIF has identified about ten potential Sites for Mt. Ashtapad. Thus to start with new investigations we must explore the artifacts/ ruins of the Ashtapad temple at these identified locations, as a part of international scientific research programs, employing new techniques as described below.

Research Plan employing New Techniques:

The identification of the above Sites is based on physical inspection and analyzing the photos taken during field trips or from the images made available through satellites. Further, the selection of the above Sites has also been carried out considering archaeological, anthropological and geological backgrounds. However, so far in order to probe the Ashtapad temple no in-depth scientific techniques have been used.

We propose to employ ground based spectral and digital imaging and space borne multi-wavelength imagery through remote sensing techniques. We plan to use ground penetrating radar, electromagnetic induction (EMI) and magnetometer to conduct non-destructive and non-invasive surveys. We describe below the preliminary approach for future research directions to probe the Ashtapad Palace Temple.

a. Ground-based Techniques:

Application of Multi-frequency Ground Penetrating Radars:

The most important and non-destructive exploration techniques include application of multi-frequency radio waves. In this context, the "Ground Penetrating Radar (GPR) and Microwave Remote Sensing Techniques" are most potential to probe the Ashtapad Temple. The Radio waves and Microwave Remote Sensing techniques provide information about the buried objects. Further, the microwave frequencies have unique properties that include day and night capability, all weather capability, penetration through snow and soil, and determination of water content in the soil as well as in snow and any other target material.

The depth of penetration for a given frequency radio wave is maximum in the case of dry snow and dry soil. The depth of penetration also depends upon the frequency, and for lower frequency the penetration depth is larger than higher frequency. This also depends upon look angle as well as polarization and type of surface. It has been observed that in the dry soil

3.0 GHz frequency radio waves can penetrate up to 30 meter while 1.4 GHz frequency can penetrate better that 30 meters and if we choose further lower frequency like 500 MHz we may expect the penetration depth to be 50 meters. The schematics of fundamental concept of GPR functioning is presented in Figure 14.

On the other hand, in case of dry snow, it is transparent up to 9 to 10 GHz. This suggests that for completely dry snow the frequencies below 9 GHz can look at the bottom of Snow, which means we can probe at the rock or soil below dry snow. However, if snow is wet then it will look at some point in the ice sheet layer and cannot reach to the bottom. Thus during summer period it would be better to probe the Ashtapad Temple ruins if buried to such an extent of 30-50 meters.

Figure 14 shows the block diagram of the GPR prototype with its major components. It has a microprocessor-based electronic section and a microwave section. The electronic section controls the GPR's operation to perform data acquisition and processing, and to display the measured results. The heart of the GPR is the microwave section that dictates the system's performance as well as its size. It consists of a receiver, a transmitter, and receiving and transmitting antennas. The pulse generator of the transmitter generates a mono-cycle pulse of 0.33 nanosecond pulse width. The pulse is amplified by the power amplifier and is radiated by the transmitting antenna. The reflected signals from the surface and subsurface will go through the receiving antenna and sampling head to produce a low-frequency signal. This low-frequency signal, containing information of the subsurface conditions, is then amplified by the Intermediate Frequency (IF) amplifier.

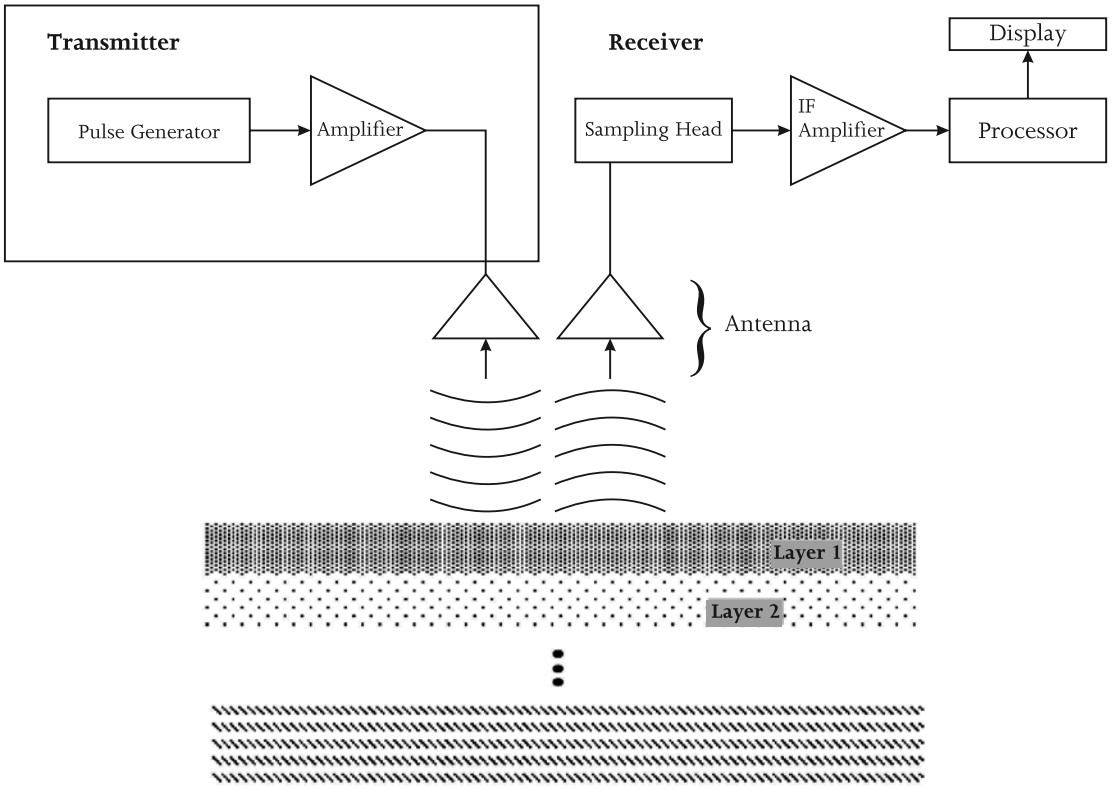


Fig.14: Block diagram of fundamental concept of the Ground Penetrating Radar

There are two types of sensors *viz.* passive and active sensors in microwave domain. The passive sensor receives the self-emission of the target. This self-emission is the function of the dielectric constant of the material, surface roughness, and density of the material. It also depends upon the look angle, polarization and operating frequency as described above.

In case of active sensor like Radar the microwave energy is incident on the target and the reflected/ scattered energy is received. The Scattering Coefficient is the measurer of the physical and electrical properties of target and of the sensor parameters just as in case of emission from passive sensor.

Individual lines of GPR data represent a sectional (profile) view of the subsurface. Multiple lines of data systematically collected over an area may be used to construct three-dimensional or tomographic images. Data may be presented as three-dimensional blocks, or as horizontal or vertical slices. Horizontal slices (known as "depth slices" or "time slices") are essentially plan view maps isolating specific depths. Time-slicing has become standard practice in archaeological applications, because horizontal patterning is often the most important indicator of cultural activities.

Now using these sensors, we can locate buried objects. In the case of remnants of Ashtapad temple in the Kailash-Mansarovar area, we have to first make a survey of the area and locate the remnants in the identified/ potential Sites. However, this part of investigation has already been carried out by ARIF through KM-I, KM-II and KM-III field trips. Further based on these field trips and studying satellite images almost 8-10 potential Sites have already been identified. Thus, for locating buried objects in these identified 8-10 Sites, we propose application of ground-based measurements employing Ground Penetrating Radar (GPR) which would be most ideal and easy to implement as shown in Figure 15, which represents a proposed step of application of GPR for searching the Ashtapad Temple. Here we can use satellite-based microwave imaging system and airborne data, if application of GPR technique would not be possible in context to political reasons.

However, GPR has some limitations *viz.* depth of penetration (typically 1 to 15 meters) is less than direct current (DC) resistivity and electromagnetic (EM) methods, and is further reduced in moist and/or clayey soils and soils with high electrical conductivity. Penetration in clays and in materials having high moisture is sometimes less than 1 meter. Further, the GPR method is sensitive to noise i.e., interference caused by various geologic and cultural factors. For example, boulders, animal burrows, tree roots, and other phenomena can cause unwanted reflections or scattering. Cultural sources of noise can include reflections from nearby vehicles, buildings, fences, power lines, and trees. Electromagnetic transmissions from cellular telephones, two-way radios, television, and microwave transmitters may also cause noise on GPR records. Shielded antennae are used to limit these types of reflections.

b. Space borne Techniques: Microwave Imaging:

Remote sensing and Imaging in Micro-waveband

Passive microwave remote sensing offers the potential for measuring many parameters (soil moisture, sea surface temperature, precipitation, *etc.*) and is important for understanding and monitoring the environment. Remote sensing at frequencies in the microwave spectrum has the advantage that it can be done at night and in the presence of cloud cover, permitting

measurements in regions inaccessible to visible and infrared sensors. Frequencies at the lower end of the microwave spectrum respond to the changes in the dielectric constant of the surface. This means a strong response to the presence of water in soils and vegetation, a response to the temperature and salinity of the ocean surface, and response to changes of state (e.g. frozen/ thawed). At higher microwave frequencies resonance's of oxygen and water in the atmosphere permit profiles of temperature, pressure and humidity to be measured.

Fig.15: Schematic generated view of a man along with GPR system heading towards possible site of Ashtapad mountain in Gyangdrag amphitheatre to probing the buried ruins of the Temple Palace.

Measurements from space offer the potential for global-scale observations necessary for understanding weather, climate and the environment. However, microwave measurements from space have been limited by the large aperture antennas required to obtain reasonable spatial resolution. Aperture synthesis is a new technology that helps to overcome some of the limitations of size, weight, and scanning associated with real aperture antennas. Microwave imaging with fine spatial resolution is possible from space using aperture synthesis without the need to scan a large aperture. The advantages gained from aperture synthesis come at the expense of reduced sensitivity resulting from the corresponding reduction in physical aperture. Sensitivity is an especially critical issue for measurements made from low earth orbit because the high velocity of the platform (about 7 km/s) limits the integration time available for imaging a particular scene.

Synthetic aperture radar (SAR) is a form of radar in which sophisticated processing of radar data is used to produce a very narrow effective beam. It can only be used by moving instruments over relatively immobile targets. It is a form of active remote sensing - the antenna transmits radiation which is then reflected from the target, as opposed to passive sensing, where the reflection is detected from ambient illumination. The image acquisition is therefore independent of the natural illumination and images can be taken at night. Radar uses electromagnetic radiation with microwave frequencies; the atmospheric absorption at typical radar wavelengths is very low, meaning observations are not prevented by cloud cover. The SAR and Mini-SAR

are currently highly capable for remote sensing applications, however, limited to surface applications such as environment, oceans, forestry, landscape, ice and glacier sheets *etc*. But with recent advancement in research and technology very soon the SAR onboard spacecraft will be able to image the buried objects in sub-surfaces of the size of the statue of Bhagwan Rushabhdev shown in Figure 16, where the angular resolution (θ_{HP}) depends upon wavelength λ and aperture D of the object.

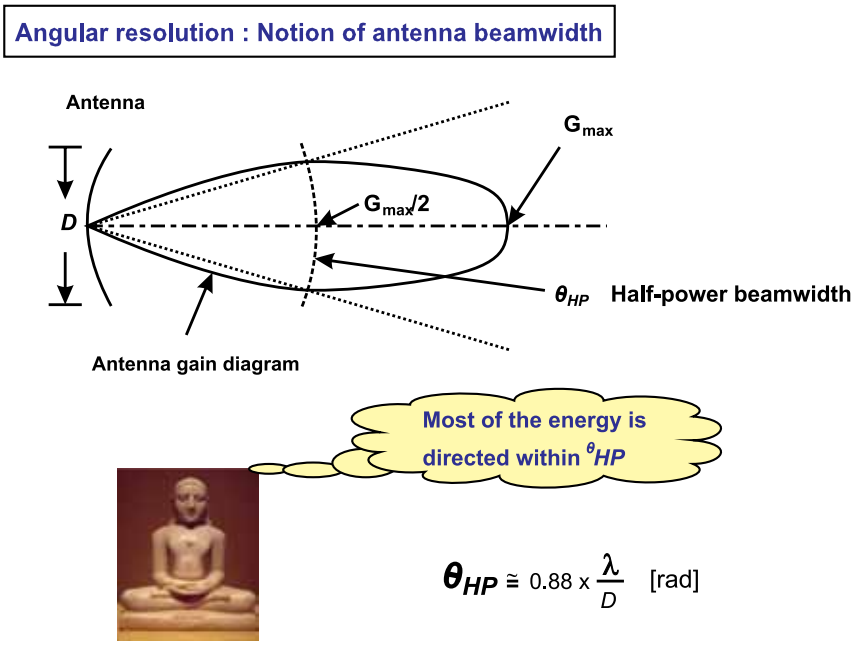


Fig.16: The microwave synthetic aperture radar (SAR) on board satellite can search buried object with spatial resolution (θ_{HP}) of the statue of Bhagwan Rushabhdev shown in the picture.

5. Discussions

According to Jain scripture the age of Bhagwan Rushabhdev would be hundreds of thousands of years and the period goes back to before the evolution of the Earth. However, such ill-defined age and period cannot be correlated with reference to scientific data available at present to explore the Ashtapad Temple. Nevertheless, one may go back in time to 10,000 to 20,000 years or even more as better and better scientific studies become available. From the above discussions, it appears that most promising period to look for evidence for Ashtapad Temple would be the period of Gautam Swami when he visited Ashtapad about 2600 years ago. In view of our derivations of the period and age of Bhagwan Rushabhdev in context to Jain scriptures as well as scientific investigations, we may conjecture that period between 10 and 20 thousand years before present would be a probable period to explore the evidences for the existence of the Ashtapad Temple. It appears that the Ashtapad temple became victim of severe climate changes taking place over the earth periodically in general, and most likely during the period of ***"Little Ice Age"*** that occurred between 1500 and 1800 AD.

Thus, firstly we must explore the past climate history by reconstructing it spanning over last 30,000 years around Kailash region. One of the ideal techniques for this task would be to investigate the sediment core from Mansarovar Lake and other nearby lakes. A core of say

~10 m may go back in time to 30000 years. The core from Mansarovar will be useful for studies of local and global climate, the Himalayan erosion, cultural, social, archaeological and even geological aspects (geomagnetism, biological changes etc.). In parallel to this task discovering the Mt. Ashtapad using radio waveband technique should also be undertaken.

Acknowledgements

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3 Geological perspective at Kailash area in search for Ashtapad site

Kewal Krishan Sharma

Possible routes to Kailash-Mansarovar Yatra area used by early vedic people

The Kailash-Mansarovar Yatra (KMY) area, although presently being reached by pilgrims along various routes through Kumaun or Nepal Himalayas, is in fact topographically, geologically and culturally, the Southeastern continuation of the Dungti-Demchok area of the Ladakh Himalayas and Shipiki La-Pooh region of Himachal Pradesh. KMY region lies in the western part of the Tibetan Plateau referred to as the "Roof of the World"- the highest and largest plateau on planet Earth. The Kailash region in the past has been approachable through various routes along Sutlej and Indus rivers. The Indian Government is presently negotiating with Chinese's Government to reopen (i) Indus Route from Leh and (ii) Sutlej Route from Kinnaur through Pooh-Shipiki La to Kailash-Mansarovar Yatra area. Both these routes are more convenient, motorable routes for Kailash-Mansarovar pilgrims and would considerably reduce their expenditure and dread while walking in the difficult and hazardous terrain of Kumaun Himalaya. Archaeological evidence from Kiari, about 100 km east of Leh, discovered by the author, suggest that Indus river has been used by Pre-Indus Civilization man at least for the past 6,700 Yrs B.P., to travel to Tibet (Sharma, 1989,1995, Otta, 1992, 1993). During the field excursion by the author in the Pakistan and Pakistan Occupied Kashmir, he saw and photographed endless rock carvings and paintings of Buddha on river boulders, side rocks and statues placed in the warship ruins and still intact temples all long the Indus River and its important tributaries, including the Archaeological site of Taksashila. This is clearly an evidence to suggest that the Indus River Route to Southwestern Tibet including Kailash-Mansarovar area has been commonly used by early Pre-and Post-Indus civilized man for tracking in the Himalayan Region and to spread Buddhism, at least since 7,000 yrs B.P. (the earliest recorded archaeological site at Kiari, Leh) till the beginning of first Century B.C. We have no data to suggest, when early man was fascinated by the charm of Kailash-Mansarovar area and considered it to be the Abode of Lord Shiva. Naturally carved statues looking like Nandi, Lion, Siddha Yogi Purush, Shiv Linga etc. seems to have fascinated and influenced the imagination of Early Vedic People who have been visiting KMY region. Searches in Vedic literature would be of great interest discovering where the earliest reference of Kailash-Mansarovar appeared in mythological literature and whether the word 'Om' was adopted after seeing the snow covering on folded rocks of Tethys Sea on the mountain along the Kumaun Track (Fig.1) now known as **Om Parvat or Chhota Kailash.** It is along the uphill climb of the

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stretch from Kalapani to Nabhidhang and near the camp at Nabhidhang in Kumaun region that one can see the unique phenomenon, of 'Om', on the eastern side.

Fig.1: Om Parvat along the route through Kumaun Himalaya is quite interesting where partial snow cover on the folded Tethys sediments very well gives an impression resembling the word Om adopted in Vedic literature.

Certainly, in view of the above, ***Tirthankar Rushabhdev*** must have visited Kailash-Mansarovar Yatra track many a times before attaining *Nirvana* at this auspicious and spiritually charged location. We must look in the mythological literature for such details, as to know, when ***Rushabhdev*** attained *Nirvana* and which route he followed or has been following to go to KMY. Certainly the Kumaun Route was difficult but must have been closer to his Kingdom where his son Chakravarti Maharaja Bharat ruled and decided to construct Ashram or Samadhi at the Ashtapad site. We must find the answer to all such questions before beginning to search for the Ashtapad site. ***I suggest forming a small group of scholars of Jainism to go through the literature in CD's Volume I-XX to make a summary of all the information related to Ashtapad and Rushabhdev. This might help in our future archaeological investigations.***

Further, in order to properly assess and search for Archaeological site of Ashtapad and verification/ confirmation by dating techniques is a must. The following facts may be kept in mind.

1. Homo species evolved in Africa and its migration routes are well established, including the Indian Subcontinent.
2. Evolution of Paleolithic and Neolithic man in the Himalayan region is well established, evinced by the discovery of hominoid fossils like Ramapithicus, Shivapithicus etc. and stone tool factory Sites from Siwalik Hills dating back from few million years to as young as Late Quaternary to Holocene, i.e ~15,000-12, 000 years. Such, climatic conditions

would have considerably restricted the movement of Vedic People to Southwestern Tibet.

3. Down valley Glaciers and cold climate existed since ~ 60,000 years and continued in Himalayan and Tibetan region till Late Quaternary (~15,000-12, 000 years).

4. The evidences of 7,500 Yrs. B.P. old site of early Indus-Civilization from Moher Gary area of Himalayan region (Jarring and Meadow, 1980), including Upper Indus valley in Ladakh (~6,700 yrs. B.P) followed by Indus-Valley Civilization of ~4,500 yrs B.P. downstream.

5. If, still the controversial age of "Ram Avatar" as 10,000 yrs B.P. is believed followed by 5,000 yrs B.P. of "Krishna Avatar" (more or less established). In this context, the confirmed age of Jainism/Jain Dharma started by Lord Mahavir in 6th Century B.C. i.e. 2,600 yrs B.P. possibly with Kshatriyas King. Traditionally Lord **Rushabhdev** (Aadinath) is recognized/believed as First Tirthankar followed by Lord Parshwa (877-777 B.C, i.e. 2,883-2783 yrs B.P.i.e., ref.-2,006) and Lord Mahavira (599-527) B.C., i.e. 2605–2533 yrs B.P. i.e. ref. 2006) when common people adopted Jainism.

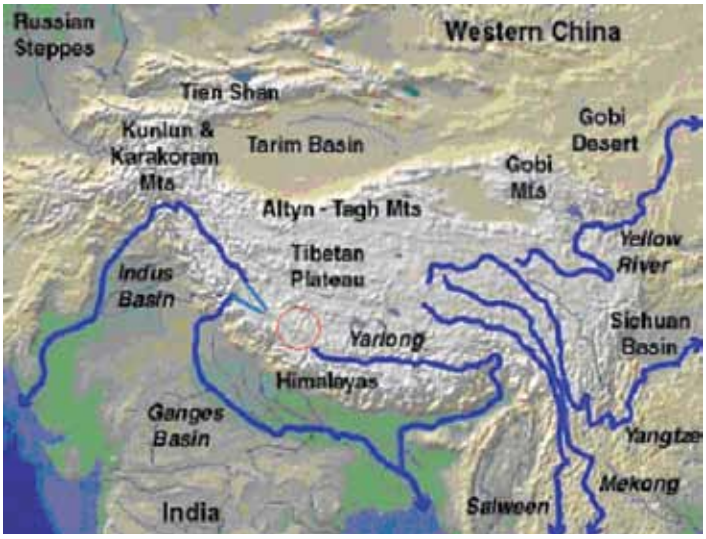

Fig.2: Topographic map of Kailash-Mansarovar and adjoining regions (KMY) showing various rivers in blue lines and travel routes in red color.

The Kailash mountain is known in Tibetan as Gang Rinpoche, or 'Precious Jewel of Snow' and has long been associated with ancient myths of Mt. Meru from which four great rivers flow and deliver life-sustaining water to millions of people (topographic map; Fig.2). Of the four greatest rivers of the Indian subcontinent all originate at the base of Mt. Kailash: the **Karnali**, which feeds into the Ganges and heads south; the **Sutlej** heading west; the **Brahmaputra** (Yarlung Tsangpo) flowing east; and finally the **Indus** (Gar) or "lion river" which heads north and then south into Pakistan. With a length of 1,920 miles, the Indus (basis for the name India) also known as Sindu (basis for the name Hindu) is one of the longest rivers in the world. The river's annual flow is about 2.4 trillion cubic feet - ***10 times that of the Colorado River, twice that of the Nile and three times that of the Tigris and Euphrates combined.*** The Indus rises beneath Mt. Kailash in Tibet at 16,000 ft. and flows northwest for over 500

miles through Tibet and Kashmir, between the Ladakh and Zanskar mountain ranges. Turning southwest, the river seeks a southern passage to the Arabian Sea through Pakistan.

Geology of the Kailash Mansarovar Yatra Region

The Geologic Map of the Mt. Kailash-Mansarovar region and Indus River headwaters in southwestern Tibet (Fig.3) is produced by the Chinese Ministry of Geology and Mineral Resources on 1:1,500,000 scale. It is located in the Gangdise Mountains, north of the Indus-Tsangpo Suture. The Indus-Tsangpo Suture is a thrust fault representing the Eocene boundary of the Indian and Asian plates. The high average elevation of this area (about 17,000 feet) is typical of the western Tibetan Plateau and results from the ongoing penetration of Indian Plate into Asian Plate at the rate of 5-10 cm/year.

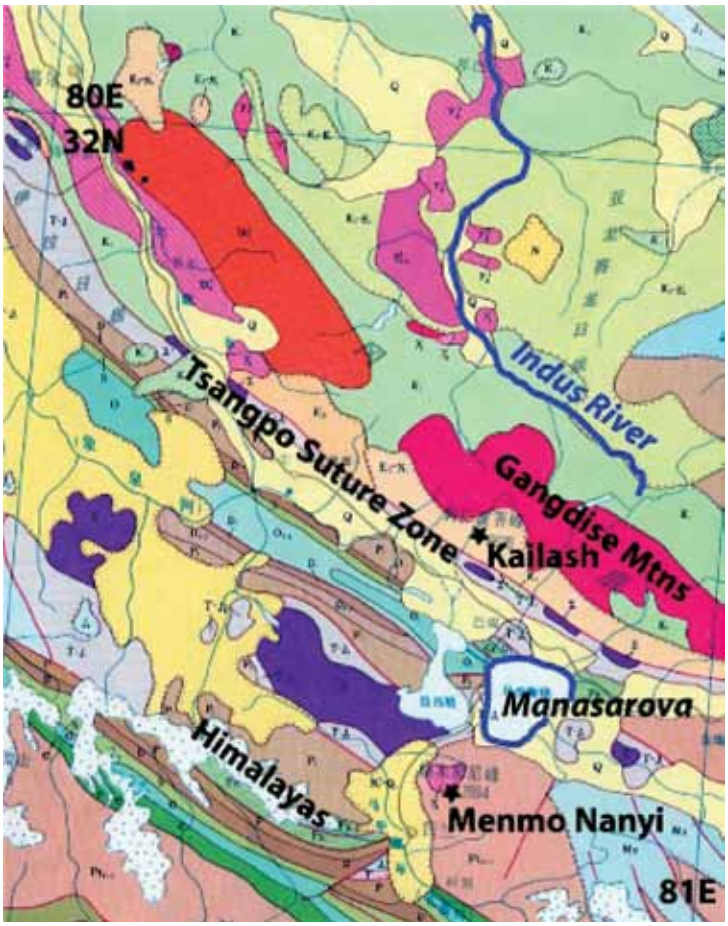

Fig.3: Geology and Geography of the Mt. Kailash Region and Indus and Sutlej River headwaters in southwestern Tibet. Red, pink and orange color areas north of Kailash represent outcrop exposures of Granitic rocks; light pink area marked EcN represent Kailash sedimentaries; the dark blue patches in light blue rock south of Kailash represents the ocean floor rocks (Ophiolites, peridotite, gabbro etc.) of the Neo Tethys. The area around Mansarovar-Rakshash Lakes is covered with Quaternary sedimentary and Alluvium fills followed southward by the Palaeozoic-Mesozoic sedimentaries of Tethys sea that existed on the northern Passive margin of the northward moving Indian Plate.

The geological and geodynamic aspects of the Himalayan Collision Zone have been published in two volumes by Pergamon Press, UK (Sharma, 1991). A brief geological summary may be necessary to properly understand the researches and efforts being undertaken to establish the location of the Ashtapad site.

Around 180 million years ago the Indian Plate represented by Indian Shield after its separation from Gondwanaland was moving northward. The oceanic crust of the Neo-Tethys Sea lying between Indian Plate and the Eurasian Plate broke along the southern margin of the Eurasian Plate. It is along this fracture zone that the oceanic crust of the Neo-Tethys sub-ducted under the Eurasian Plate, resulting large scale magmatic activity (volcanism and plutonism) along this active margin from 150-40 million years period. Ladakh-Gangdise mountain belt largely represents the volcanic eruptions and the intrusive granitic rocks of that period. The granitic rocks which emplaced as hot magma with time cooled crystallized as coarse grained rocks, called Ladakh-Gangdise Granite. As the Ladakh-Gangdise mountains started uplifting its cover rocks got eroded along with the granites. Rains washed the debris down slope and small rivers deposited these sediments as layered sedimentary rocks as shales, sandstones, grit and conglomerates, in the fore deep basin of the rising Ladakh-Gangdise ranges. These rocks are technically called Ladakh-Kailash Molasse. Horizontal beds of hard, massive, compact sandstones, shales, grit, conglomerate etc. are now exposed on the Kailash Mountain and its adjoining peaks and are quite evident in most of the photographs. The granitic rocks exposed on the Gangdise Mountain, north of Kailash, once formed at a depth of 7-8 km are now exposed on the surface suggesting erosion, removal and deposition of 8 km thick cover rocks and its debris deposited in the Ladakh-Gangdise Fore deep.

As regards Kailash Sedimentary rocks, it would be of interest to mention that these hard, compact, horizontally lying sedimentary rocks (conglomerates, grit, sandstones, shales etc) when subjected to wind and snow action, can acquire various shapes. Most of the interesting imaginary shapes looking like Lion, Nandi, Shiv Linga, Siddha Yogi Purush, according to my long experience in Ladakh, look like weathering and erosional features carved by natural processes. All such features, before they are believed as man-made, needs detailed study. A smaller snow-peak called Trijung, situated on the western side of the Kailash peak, is said to be the abode of Dorje-Phangmo (Ref. 45). This place is also known as Bonari (Fig. 5 of Thakker's Report) is an interesting location. To me this appears like a triangular faceted fault scarp where subsequent erosion has carved Siddha Yogi Purush, Shiv Linga and other features.

Possible Archaeological site for Ashtapad

The present location of Gyangdrag Monastery and the ruins of an old Monastery Siteseen in the photograph below is an interesting site. The stones used in this ruins seems large and shaped to make into blocks for the construction of this site. As it appears from the photograph, they must have been brought from some distant place. This ruin site gains importance as Dr. Thakker has already identified at least three such Sites in the region by IRS images which together with Gyangdrag Monastery are likely Sites to be further investigated to search for Ashtapad site.

During my literature survey, I found the following photograph (Fig.6) of an old glacial lake (photographed from northern side of Kailash Mountain possibly Gauri Kund). Obviously, there are possibility of many such lakes and the moraines around the area and in the vicinity of the exiting Monasteries and old ruins. The boulders from such moraines might have been used in the construction of old ruins. The photograph (Fig.5) does not show any wood logs normally used in

such construction. Possibly, any wood used in these ruins must have been removed and used by locals, forced by climatic conditions prevailing in the region. Search for wood pieces used during Archaeological site construction is vital to date the site. During future investigations one should carefully look for the nature of the stones used in construction and the buried wood pieces, if any.

Fig. 5: Shows Gyangdrag Monastery and its environs

Fig. 6. A small glacier feeding lakes bounded by moraines on the north side of Mt. Kailash is a remnant of the great ice sheets that covered northern Asia and Tibet Quaternary. The last ice sheet began retreating about 10,000 years ago. Photo by Travis Winn. Reference: ***Mt. Kailash Kora and the Indus River Headwaters*** *by Pete Winn.*

Dating - A must to establish Ashtapad site

I personally feel, that the search for Ashtapad Site, as elaborated by Dr. Thakker, is going

on in the right direction, I would like to suggest the following approach to be followed in further searches to establish the Ashtapad Site, scientifically and date the event.

Once the Archaeological site of Ashtapad is narrowed down either to the vicinity of the Gyangdrag Monastery and three Sites of IRS images southwest of Kailash or to the site No-10 &/or 11, we should work out an exploration/excavation program with the help of various Agencies and scientists from China, in order to collect proper samples under the guidance of experts for dating.

Accelerator Mass Spectrometric dating of cosmogenic nuclides, such as C-14 and Be-10 would be the most dependable dating techniques. The C-14 samples of carbonaceous/vegetable matter buried at the Site, such as stored food grains, human excreta, wood pieces, human bones etc. would be of significance. In case we find some human or animal bones, we should be careful in proper documentation and sample collection. The cut stone blocks used for the buildings can also be of help to date the events by Be-10 exposure dating technique. Two Be-10 exposure dates available from KMY area of the naturally eroded surfaces i.e. 57,000 years exposure age of a granite sample from 4,700 Meters height and 12,000 years of a granite sample from 4,500 Meters height closer to Indus River (Nishiizumi et. al., 1993) encourages us to undertake detailed sampling of naturally exposed rock surfaces around KMY area by erosion and other natural processes.

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Chapter - 02

Three Field Trip Reports

• En-Route to Kailash	Photo Gallery
• Shree Ashtapad : A Possibility	Bharat Hansraj Shah
• Field trip I - Summary report	Rajnikant Shah
• A report on field trips I and II to locate site for Ashtapad near Kailash in Tibet	P.S. Thakker
• A reconnaissance mission to locate the Ashtapad Temple	John Vincent Bellezza
• The Ashtapad Initiative	A. K. Verma
• Kailash area map	Folded Map

Introduction

Initially Bharat Hansraj Shah visited Kailash on his own few times and took many pictures and presented his views of Nandi as a probable site for Ashtapad.

Three field trips were organized in the summer of 2006, 2007 and 2009 to find the existence of Ashtapad near Kailash in the Himalayas. The team consisted of engineers, Jain and Sanskrit scholars, archeologists, space scientists, climbers and professional photographers. This chapter describes the observations made by team members and their findings. In 2006, a twelve member team joined for the first time to look for Ashtapad. Dr. Shah gives a summary of observations in his article. They could not locate anything definite and it is all but nature.

Dr. Juyal, a geologist and Dr. Thakker, a space specialist, joined the trip in 2007, and according to Dr. Thakker there could be nine or ten places where a possibility of Ashtapad exists. The third trip called KM III, expedition took place in 2009 when an archaeologist, Dr. Bellezza, undertook a trip to locate the ruins, if any, but yielded no physical evidence of Jain temple. In the absence of any physical evidence, Dr. Bellezza, the team leader encourages the view that Shree Ashtapad is Mount Kailash itself. Similar views are expressed by Dr. Verma in his article.

Photo Gallery has photos of En-Route to Kailash.

A folded map of the Kailash region is included in this chapter.

Kesar Library, Kathmandu, Nepal

Potala Palace with Lhasa

Jukhong Temple, Lhasa

Meeting with Lama

Sera Monastery

Meeting a Lama from Sikkim

Key at Saga

Swastik on a house - Ness village

Swiss Library in old Gompa at Darchen

Tibetan Literature

4 Shree Ashtapad – A possibility

Bharat Hansraj Shah

Left Side : *Mount Kailash is Ashtapad ?* **Right Side :** *Mount Nandi is Sinh Nishadhya Prasad ??*

By the grace of God, I had been to the pilgrimage of Shree *Kailash-Mansarovar* five times; First time during June/July 1993 then in July/Aug 1996, June/July 1998, June 2005 and July 2007. During these *yatras*, I performed regular *parikrama* (54 KM in three days), Inner *Kora* (40 KM in two days) and *Nandi parikrama* (21 KM in a day). Shree *Kailash Mansarovar yatra* is considered as the toughest pilgrimage. There are many books mentioning *Mount Kailash* and holy Lake *Mansarovar* as the most sacred religious place of Hinduism, Jainism and Buddhism.

Mount Kailash and holy Lake *Mansarovar* are situated in Ngari region of Tibet. *The yatra* is organized by the Ministry of External Affairs - Government of India and taken care by Kumaon Mandal Vikas Nigam of Uttar Pradesh Tourism. The selection of *yatris* is done in such a manner that each batch of approximately 30/35 *yatris* represent culture of India i.e. religion, education, language, profession, age etc. Physical fitness is the first criteria. Each year about 12 batches of

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total 360/400 *yatris* are given Chinese visa for *this yatra* The *yatra* starts from Delhi and ends at Delhi in 30/31 days. Total journey by automobile is approximately 1440 km., and trekking including *parikrama of Mount Kailash* and holy *Mansarovar* is 330 km. The highest altitude reached is 18700 ft at Dolma Pass. On trekking route, use of horse and yak is optional. By the grace of god I completed first three *yatras* on foot by this route.

Fourth yatra by air-road route; Kathmandu-Lhasa 1000 km air travel overlooking Mt. Everest peak, Lhasa - Kailash road journey. Fifth Yatra route Kathmandu -Kailash 900 km by road. Both these yatras were sponsored by Jain Center of America, New York

During my first pilgrimage I came to know the place called *Ashtapad*. It is the *Nirvana* place of Lord Aadinath Rushabhdev, the first *Tirthankar* of Jainism. In Jain literature it is mentioned that, *Chakravarti* Bharat, son *of first Tirthankar* Lord Aadinath Rushabhdev, built huge temple of all 24 *Tirthankars* at *Ashtapad*.

Jainism is an important religion in India. Its followers are settled abroad also. Mainly Gujarati, Marwari and Punjabi community follow this religion. *Darshan, Gyan, Charitra, Tapasya* and above all *Non-Violence* are its main Preachings.

In this religion followers worship twenty four *Tirthankars*. Aadinath Rushabhdev is first *Tirthankar and* Vardhaman Mahavir is twenty-fourth *Tirthankar* of present *Chovisi*. At any time there was only one *Tirthankar* to guide that prevailing time's community. It is believed that next *Tirthankar* came only after the *Nirvana* of previous *Tirthankar*. Twenty fourth *Tirthankar* Lord Mahavir attained *Nirvana* on 15th October 527 B.C. i.e. 2525 years ago.

Lord Mahavir's discourses covered all subjects of this world. It is said he delivered the *Desna* i.e. Discourses by sitting on *Samavasaran* made by *Indra* in such a manner that his face was visible in all four directions. The *Samavasaran* attended by all living beings, deities, human beings, animals, birds etc. It is also believed, his discourses were audible to each living being in its own understanding. Lord's discourses are called *Aagam Vani*. Lord Mahavir gave discourses on religion, science, mathematics, geography, sociology, astrology, history, future, universe etc. These discourses mentioned above as *Aagam Vani,* were retold and written by his followers, who had adopted spiritual life/saints life and who had gained mastery in their subjects of choice as mentioned above. These scripts written are known as *Aagam granth* and are at present of immense importance. These *granths* are deeply studied at present by all ancient language scholars world over. Its scientific and mathematical approaches are amazing.

As time passed the knowledge was distributed by way of lectures and write-ups by saints and scholars of the society. Among most revered and authentic saints of this religion was *Acharya* Hemachandracharyasuriji (Vikram Samvat 1145-1229). He was a saint in the kingdom of Sidhdhraj Jaysinh and Kumarpal, the rulers of Patan in Gujarat some 850 years ago. His book *Trishashthi Shalaka Purush Charitra* is a masterpiece of this religion. It consists of detailed studies on lives of 63 most important characters of the society. Details given of 24 *Tirthankars*. 12 *Chakravartis, i.e.* King of kings, 9 *Vasudev*, 9 *Prati-vasudev* and 9 *Balbhadra*. All these dignitaries are well accepted in Jain and Hindu mythology.

As per Jain scriptures, the first Tirthankar Bhagwan Rushabhdev attained Nirvana on the Ashtapad Mountain, Mahavir Swami at Pavapuri, Vasupujya Swami at Champapuri and Bhagwan Neminath

at Girnar. The other 20 Tirthankars attained Nirvana at Sammet Shikar. It is believed in general that Ashtapad is out of reach. All other places of worships are visited by devotees.

After my return from first yatra of Mount Kailash and holy Lake Mansarovar, I started collecting details about Ashtapad. I took guidance from saints and scholars of Jainism. So far I have refered:

1. Kalikal Sarvagna *Acharya* Shree Hemchandracharyasuriji's *Tri Shashthi Shalaka Purush Charitra*. In its, *pratham Tirthankar* Shree Aadinath Rushabhdev's *Nirvana* chapter, Mount *Kailash* is believed as *Ashtapad* (*parva-1, sarga-6, page-242, Gujarati*).
2. Shree Dipvijayji's *Vividh Pooja Sangrah* (*Gujarati*), *Mount Kailash* is mentioned in Shree *Ashtapad Pooja*, page 514 to 536.
3. In *Vividhtirthakalpa* by *Acharya* Dharmaghoshsuriji, *Mount Kailash* and *Mansarovar* are mentioned *in AshtapadMaha Tirthkalpa* (18) *and Ashtapadgirikalpa*' (49).
4. The description *of Mount Kailash* believed as *Ashtapad*, is also found in Muni Shree Jayantvijayji's *Poorva Bharat Ni Jain Tirth Bhumio* (Gujarati).
5. In Shri Hiralalji Duggad's book *Madhya Asia Aur Punjab Mein Jain Dharma Ki Prachinta Aur Lokmat Mount Kailash* is mentioned as *Ashtapad*. Page 46.
6. Same opinion can be seen in *Pratikramansutra - Prabodhtika's Jagchintamani Chaityavandan - Sutra* 11-4. Page 282 to 287. (*Gujarati*).
7. In *Kailas-Mansarovar* by Swami Pranavanandji, it is believed that Lord Aadinath Rushabhdev attained *Nirvana* here (Appendix iii, page 219.)
8. I have read an article by Shri Kami Desai in *Mumbai Samachar* a *Gujarati* daily newspaper of Mumbai, paper dtd. 22-9-96. In this article the author has written that Jainism experimented on *alchemy* and it is related with the *Agni-Tatva* in the body. So their temples are mostly on dry places or where there is poor greenery. (Geographically *Mount Kailash* is in barren land).
9. Mr. John Snelling in his book *The Sacred Mountain* compared *Mount Kailash* as a very huge temple. He has compared the photograph of *Mount Kailash* from a particular angle with the outline of a Hindu temple.
10. In the government guide book given to the *Kailas-Mansarovar yatris, Ashtapad* is mentioned on page 13.
11. In *Kalyan Magazine* by Geeta Press-Gorakhpur, Mt *Kailash* is mentioned as *Ashtapad*. In this book it is also mentioned that, there were Jain temples.
12. *Jain Puranoka Sanskritik Adhyayan* by Dr. Devi Prasad Mishra, In this book's chapter *Bhaugolik Dasha* on page 440, Mt *Kailash* is mentioned as *Ashtapad*. It is situated in the southern part of Himalaya, as per 'WAHI' by Dr. S.M. Ali (page 56). The geographic situation of Mt. Kailash Ashtapad fits here.
13. In *The Peaceful Liberators - Jain Art from India* by Shri Pratapaditya Pal of Los Angeles County Museum of Arts - Los Angeles (USA), the author has written about the holy places of pilgrimage in Jainism. He has mentioned that Mt *Kailash* is *Ashtapad*, situated in the himalaya is one of the sacred most mountain and place of pilgrimage in Jainism. The other sacred mountains are Sammet Shikharji, Shetrunjay Siddhachalji and Girnarji. (pg.65).

During 1995-96, I sought guidance from *Acharya* Shree Vijay Janakchandra Suriji and *Acharya Shree* Vijay Dharmadhurandhar Suriji. Both talked affirmative and blessed me. In 1997, I sought guidance from *Rashtrasant Acharya* Shree Padmasagar Suriji. The learned saint was very happy and satisfied with the findings and blessed me for further studies in this direction. I also approached Saint Jambuvijayji M.S. in November 2006 for his guidance and opinion. He opined Ashtapad is situated somewhere near Badrinath in Himalayan Range.

During my last four *yatras*, going further away from stipulated and regulated route, I have tried to explore any possibility of Kailash as Ashtapad. The particular place, I have visited and photographs-slides I have taken, shows excellent results inviting more study in that direction. There is a cathedral like chiselled mountain in front of south face of *Mount Kailash*. An image of sitting lion can be seen on its top. ("Sinh Nishadhya Prasad"). Vertical sculptures are visible on its middle part. A 'sitar' like musical instrument is also visible with one of the sculptures. The top of few mountains near this mountain are very identical. Their top are rectangular in shape in front. The mountains themselves are also identical and are of the shape of *Gopurams*. There is a *Gokh* (*Zarookha*) clearly visible in one of the mountain facing *Nyari Gompa* across the river. In the same range there is a sphinx like huge image in a mountain. Few cubicle shaped huge stones are lying in the area. Gear teeth shape marble stones are also seen in a pillar like shape in one of the mountains. Bevelled marble stone border is also visible in one of the hills. *Chabutara* shaped ruin is also seen at a place. All this shows that in the past, a large scale human work might have been done at this place. In Jain Religious Texts it is mentioned that huge temples, *chaityas*, *stupas* were erected in *Ashtapad* vicinity.

Is Mount Nandi Sinh Nishadhya Prasad ?

I was approached by *India Today*, India's most acclaimed magazine. They approached Shree Shatkari Mukhopadhyay, coordinator of Indira Gandhi National Centre for Arts, New Delhi, for second opinion on my findings. The learned authority has endorsed the possibilities. Please refer *India Today* dated 30-09-96. Page 158.

It would be fair to mention here that, at present also the saints in Jainism are competent enough in knowledge, but to visit that place is a difficult affair for them because of their rituals, like *Gochari-Pani* etc. Jain saints do not use any vehicle and to visit *Kailash*, which is in world's most thinly populated area, as also food arrangement for them is very difficult. I earnestly request

Jain leaders to pay attention on this sacred subject, so that a clear guidance can be obtained from the present Jain saints, provided their yatra to *Kailash* is arranged. I was told by Tibetan guide late Mr. Dorji that in Tibetan religion it is mentioned that Bhagwan Munisuvrat Swami (20th *Tirthankar*) visited this place. During our 4th yatra we found above mentions in Tibetan religious book "GANGKARE TEASHI". Page-101.

Here are few more facts / points to substantiate the above theory,

1. *Mount Kailash* is surrounded by snow glaciers and the Mountain itself is so steep that, it is extremely difficult to climb. The description of *Ashtapad* thus fits here.
2. The chiselled mountain in front of south face of *Mount* **Kailash** is known as *Nandi*. The *Nandi* is *Lanchhan* i.e. sign of Lord Aadinath Rushabhdev.
3. There is another tall snow caped magnificent mountain about 50 km south of *Mount Kailash*. This mountain is known as *Gurla Mandhata*. *Mandhata* was ancestor of Sagar *Chakravarti*, whose name is linked *with Ashtapad*.
4. One can have *Darshan of Mount Kailash* from holy Lake *Mansarovar* also. The name of *Lake Mansarovar* is mentioned in Jainism.
5. Between *Mount Kailash* and *Gurla Mandhata*, there is another spectacular lake known as *Rakshas Tal* or *Ravan Tal*. In Jain Indology King Ravan is mentioned as firm disciple of Lord Aadinath Rushabhdev.
6. The whole area is rich in minerals and metals. The extraction is not permitted. Because of its richness, the vibration felt in this region, is a matter of experience. No one can express the feelings in words. The combination of this land, the lakes, the mountains, the clouds, and the sky is just majestic-mystic-Daw and so it is considered the best place for meditation.
7. Similarities between Mahadev (Hinduism) and Rushabhdev (Jainism).

Vahan of Mahadev	:	Nandi
Lanchhan of Rushabhdev	:	Bull
Place of Mahadev	:	Mt Kailash
Nirvan place of Rushabhdev	:	Ashtapad
Worship Tithi of Mahadev	:	Shivraat i.e. Maha Vad Teras
Nirvan Tithi of Rushabhdev	:	Maha Vad Teras

This comparision also strengthens the possibility.

I have very poor knowledge of Jainism, though I am a Jain. But whenever I think about our religion and related *Tirthbhoomis* two questions come in my mind that when:-

- We believe in *Siddhachal Maha Tirth* at Palitana in Gujarat as a *Shaswat Tirth*
- We believe in Sammet Shikharji at Madhuban in Bihar as the *Nirvana Bhoomi* of our twenty *Tirthankars*.
- We believe in Hastinapur a place some 125 KM away from Delhi, where every Jain wishes to perform *Varsitap* and celebrate its *parna*. At Hastinapur Lord Rushabhdev was offered *Ikshuras Parna* by his grandson King Shreyans on completion of Lord's *Varsitap* (thirteen months alternate day fasting with daytime boiled water only).

- We believe in many more places of worship, related with our *Tirthankars* and *Tirth as* mentioned in our Religious Books,

  Though the history of all these places mentioned above, is at the most as old as our existing civilization, Then

Is this Mount Kailash - Ashtapad ? &
Is this Mount Nandi - Sinh Nishadhya Prasad ?

"Shivalay" and sign ?

Face ?

Triangular cuts and "Jaldhara Mukh"

Bevelled "Asan"

Top left - image of lion, right - two tops identical.

Is it "Sphinx"?

"Mangal Murti Gokh" or "Gavaksh", and in front of it, Is it a statue in Padmasan ?

Left - Nandi Parvat, right - Gopurams

Holy dip in Mansarovar (Area approx 350 sq. Km.)

Spectacular Ravan Sarovar (area appx. 250 sq. Km)

Notes and Observations

- I was invited to present this paper and related photographs - slides, at International Seminar on 'Pilgrimage and Complexity' organized by Indira Gandhi National Centre for Arts - New Delhi, during January, 1999
- My submission of this work to the Archaeological Survey of India, New Delhi in the year 1999, is not yet endorsed or rejected.
- Geologists opined my 'submission' as my optical illusion and termed my findings as natural formations and not human work.
- Recently, a scientist from ISRO (Indian Space Research Organisation) studied satellite images of Tibetan Himalayan Range and opined there is a possibility of human work done in Kailash region.
- A researcher in Chile was studying on mountain series in a Chilean province, He found them as Man-made chain of pyramids and not natural mountain formations, which was only recently endorsed by the Chilean Archaeological Department after detailed surveys and studies. Discovery channel disclosed this on its programme "TERRAX" on 04-01-2005.
- En-route to Kailash we have seen native houses doors with Swastik, Siddhashtla, Astmangal signs which are common Jain symbols.
- During my fourth yatra in year 2006, our team members Dr. Kirit Gosalia (of USA) took a photograph of main deity at Nyari Gompa. The deity is in Padmasan, fully clad and decorated with jewellery, only face and forehead being visible. We saw a probability of this deity being a Jain idol, so we tried to have a glimpse without clad, but this was not allowed inspite of our best efforts.
- During my fifth yatra in year 2007, our team member Dr. Alok Tripathi (Supdt. Marine Archaeological Survey of India, Delhi) opined that the above mentioned photograph is most probably of a Jain Tirthankar.
- I have heard a priest chanting 'Arham' (this word is connected to Lord Rushabhdev) in his prayers in front of a deity at Nyari / Chugu Gompa.
- Also I have seen natives bowing in 'Khamasamana' manner in front of the deity in the above said Gompa.
- Most of the images I have mentioned (page-4 last para, page-5, 1st para) are opined as natural formations by our Ashtapad Research Team members (my 4th & 5th yatras).

Points of View

- Four Ex US President's heads are crafted on top of Mount Rushmore in Colorado, some 70 years ago. US Govt. takes proper care of this human work fearing climatic decay. Now let us imagine the fate of this great human work some 1000/2000 years later. We may face large scale damage-decay to these open-to-sky creations due to erosion with time and climate. It may go beyond recognition, but people in future will admit it as human work, because of literary proof and evidences.

- Then is it unjustifiable to think and explore possibility of Nandi Parvat as 'Sinh Nishadhya Prasad' & Mount Kailash region as Ashtapad, which has a thin line of doubt between natural formation and human work? We in the present civilization have religious texts to support this theory.
- Let us compare Shetrunjay Maha Tirth with Ashtapad Maha Tirth.

  Religious Texts read Shetrunjay base has shrunk from Visnagar to Vallabhipur and now to Palitana. The base shrunk considerably from 50 yojan to the present state. The top has shrunk from 10 yojan and the height from 8 yojan to the present smaller state

  In case of Ashtapad which is mentioned in the Text as Mt. Kailash, the Text reads: base stood 12 'yojan from Ayodhya and height 32 'kos. The base of Mt. Kailash at present stands near Tarchen village of Tibet, and the height stands at 22000 ft above MSL (mean sea level).
- Are the shrinking processes at Shetrunjay and Ashtapad not comparable?

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I thank Shri Hemubhai Sheth Mumbai for sponsoring me as Ashtapad Research Team (Team Leader) in 2007.
I am grateful to all who have guided and supported me for this noble cause.

Research yet not concluded
Participation of Jain Community requested.

5 Field Trip I – Summary Report

Rajnikant Shah

In summary, it was a maiden effort to try and look for Ashtapad and find the exact location if it exists today. From scriptures and literatures one finds lots of information and description about Ashtapad Tirth. (See Vol. I to X) Many modern authors mention about Ashtapad but no one has seen or located it. At this present day, information is passed from one to another.

As it was the first field trip undertaken, no scientific studies were done. Preliminary work done is being presented here and this report is based on observations only. Further field trips with specialized team members like geologists and archaeologists should be undertaken. The views expressed in this report are basically preliminary only. Reports by various other team members are based on field observation. Different opinions expresses by various team members are their views only and nothing can be accepted as final.

As per scripture

It is believed that all the four religions flourished at the footsteps of Kailash. According to MIT (Massachusetts Institute of Technology) research and other reports, civilizations started here. As for local history, the Shang Shung Empire flourished in those days. One also has to believe that Hinduism and Jainism both had their roots in Kailash. Bon Po religion is the indigenous religion of the area. It may be difficult, if not impossible; to prove or even to disprove whether all these existed at that time and how far these are the facts. People have already started debating that Shiva and Aadinath are same and the two philosophies developed differently from here onwards into Hinduism and Jainism.

Bon Po- original indigenous religion in this area- they have their own beliefs about Kailash. According to Hinduism, this is the abode of Shiva and Parvati. According to Buddhism, Milarepa went up the Kailash with the help of sun rays. According to Jainism, the first *Tirthankar* Shri Rushabhdev attained *Nirvana* here and his son, King Bharat constructed *Sinh Nishadhya* Prasad on Ashtapad and later on 2600 years ago Gautam Swami climbed Ashtapad with the help of sun rays.

The relation between Shang people and Tibetan-Jian

At the time around 1,400 B.C., there were a semi-Tibetan people called 'Jian' mixed with

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Shang people. From the oracles, we see frequent phrases as 'Today we captured 50 Jians.' Certainly, some Shang people were captured by Jian, but not recorded. Also, the Tibetan people were considered to be the descendants of Jian by some scholars in the past. Today, Jian and Tibetan are classified as one race, Jian-Tibetan people. However, we are satisfied with the closeness of Tibetan and Jian.

One of the Kings of Shang Dynasty had a name Jian-Chia. There were possible explanations of his name, maybe his mother was a Jian. There were some inter-caste marriage between Shang people and Jian people who lived near each other.

Let us consider the life style of the two people. The name Jian has a root in *Yion* (goat, the animal 'sheep' was transported to Han people from Northwest during Han Dynasty, sheep was called Hu-Yion, and later Mion-Yion), which indicates that the Jian were likely to be goat raising nomads. This observation matches with the later records of Jian people. On the other hand, Shang people were semi-nomadic with settlements. On the religions, both believed shamanism and both used bone-oracles. In fact the ancient Tibetan written language was carved on bones.

Bon Po Religion

We are going in detail and trying to learn about Bon Po religion where we hope to find some useful information. We are also studying the relation between Shang and Jian-Tibetan people. There are many Bon Po monasteries in northern India spread from Leh-Ladakh, Himachal Pradesh, Nepal, Sikkim up to Bhutan. There is a Bon Po school in Kathmandu which we had visited. A lot of research is going on for Bon Po at international level especially in Italy, Switzerland, Germany and USA. All this research may help us in future.

Jain Scriptures

Shri Gautam Swami had been to Ashtapad 2600 years ago (after getting permission from Bhagwan Mahavir). He climbed up with the help of sun rays. He stayed overnight and worshiped all twenty-four Tirthankar Pratimaji and he wrote the first two Jag Chintamani (Gatha) verses there. On return, 1503 Tapas were waiting at the base of mountain, as they could not climb. Then there was *Kheer Parna* story. Taking in consideration all these facts from the scripture, one thinks that Ashtapad existed 2600 years ago and it survived thousands and even lacs of years since Bharat Chakravarti had built it after the *Nirvana* of Bhagwan Rushabhdev on Ashtapad.

One would like to know what happened since then, in the last 2600 years, that has caused it to disappear, as we are not able to locate it in the present time. Two thousand six hundred years is not a long period in terms of history or geography or even civilization. If it could exist from 1st Tirthankar to 24th Tirthankar, then why is it untraceable today? At many places in literature, it is mentioned that Ashtapad is lost (*lupt*) then why we are trying to locate it?

As per scriptures, Ashtapad is located twelve and a half *Kosh- yojan* north of Ayodhya and is visible from Ayodhya on a clear day from a high point. If this is true, why are we looking for Ashtapad in Kailash region- thousands of miles away from Ayodhya? Another question arises- if this is the Ayodhya? Some people believe that Ashtapad is near Badrinath. What to believe is one's own belief, as there is no concrete evidence today.

Buddhist Gompa's

Earlier Bharat Bhai had suggested that we visit Gyangdrag, Nyari and Serlung Gompa. We visited these Gompas a couple of times- checked and discussed with local Lamas- went up the mountains- no confirmatory evidence or physical evidence was found. These are all Buddhist temples thousand to fifteen hundred years old constructed after 7th Century when Buddhism was introduced in Tibet much later after Jainism.

Due to weather, one could not reach the Nandi top on the last day. However the climbers and photographer managed to go nearby and get some pictures. Caves in Mount Kailash cannot be reached and hence no information is available. A small hole on cave or *Gokhala* (*Gavax*) in one of the other mountain opposite Chuksum Gompa was reached and nothing could be found. It was just natural formation. No statue was detected (see report on 7th of June at Nyari or Chuksum Gompa). Regarding *Namaskar* sign on the left of Ghengh la Gompa, one could not see or confirm any.

In general, our main aim to go to Lhasa was to find any reference to Shri Rushabhdev, Aadinath, Ashtapad, Nirgranth- Shraman and Jainism in Tibetan literature. We visited different monasteries and met various Lamas. Basically they did not know about Shri Rushabhdev, Nirgranth, Ashtapad and Jainism. They could not give us any reference to Tibetan literature. Mostly they discussed about Buddhism, which was introduced in Tibet in 7th century. Previous to that they did not know anything with reference to old religion. Our aim was to go back in history for at least 2000 to 3000 years.

Location

In the Kailash area there are four or five different locations, which are believed to be Ashtapad. Some believe that Kailash itself is Ashtapad- the other places are Nandi Parvat, Gyangdrag Gompa, *Moksh Dwar* (Chuksum Gompa) and to some the whole region is Ashtapad with eight mountain peaks. Now satellite pictures suggest another possible Ashtapad site at Dharma King Norsang.

Due to lack of any physical evidence it is difficult to say what the truth is and which is the exact location. All the travel agents talk and take you to a different place for Ashtapad.

Nature

Thousands of years ago people worshipped nature, sun, wind, earth, rain and other things in nature. They treated them as god if one goes to Japan, China, oriental countries and India. As we learned more- as time progresses now we have started understanding the nature, sun, moon, rain, earth, wind, etc. As civilization grew religion started coming up and accepted natural powers as God in the beginning. Now everything is being evaluated on scientific basis as well.

In Kailash Mansarovar area when one travels, we see the snow-capped mountains, (snow melts on lower mountains during summer time), streams (as snow melts) rivers, lakes (two big lakes- Mansarovar and Rakshas Tal), plain (valley is called Barkha or plains), very little grass, no trees, few animals and birds - all that one sees and finds is just nature- Mountains,

snow, streams, rivers, lakes and valley with little grass and few animals, birds and few people.

Construction activity and ruins are to be proven yet. We only see and feel nature. Snow, rain-wind and time which have caused stones to break and slide down as you look at mountains- one could see lots of cracks in stones. It seems that many of them are brittle. Geologists have to check and give a special report about the brittleness of stones and effect of weather and natures. What looks and seems natural- stones are breaking down all along the way on the sides all the time on the way to Kailash- one finds pieces of rocks lying around- spread all over- it is a rocky terrain and whole area is sprayed with rocks.

If we look at the mountain, we see step like structures of the mountains as if it is carved by humans. Again carved by nature could be another possible explanation. And because of weather, stones keep breaking and sliding down and only leaving behind partial step formations. In the end, some mountain structures stay strong, while others remain brittle and breakdown.

Regular & Aerial Photographs

With the study of photos whatever is available, one could not convince oneself that there is a temple or any evidence of construction activity. Satellite pictures may help and of course archaeologists have to dig in and try to find the ruins and other evidence. Dr. P.S. Thakker has located a site for Ashtapad with the help of aerial photographs south-east of Kailash. Site is known as Dharma King Norsang. Dharma King means king of religion and Norsang means lion in human beings. This may match with Sinh Nishadhya Palace constructed by King Bharat. There is a trench surrounding the area. This may match with King Sagar's sixty thousand princes' story. The place has yet to be confirmed. Details are to be carried out using GIS and other satellite data followed by archaeological excavation.

Conclusion

As of today we have not come across (in ten days) any *Siddh Purush*, a special person, monk or lama worshipping there or staying there. In ten day's experience it will be very hard to say, if not impossible. To survive the winter here is hard. With the snow in winter all over one cannot do anything, even the lake gets frozen, what one will eat or drink and what help one can get. To me there are many issues that need to be addressed. It may be very simple thinking and we may not understand all the details, but the fact remains that it is all nature there. To go beyond, one has to have special vision, special thinking, and special knowledge to fully understand and believe that something else once existed and that the stories of the past are true and facts beyond all doubts. This is entirely my personal observation and strictly my own view. What I saw within a short period of ten days and what impression I have, I am just describing it. It needs further research and not only on religious front but also from history, geography, geology, archaeology, civilization and culture. A broad based team with many facets- people from different walks of life- should work together and work on scientific basis with all modern tools available for research. One needs time and funds to undertake such a monumental task. It will not be easy with so many different religious views or faiths- it will be very hard to prove or disprove some things.

In conclusion it is all nature and no physical evidence could be found as of today. I wish to

suggest the following plan of action for future reference and research.

Suggested plan of action

- Continue collection of literature on Ashtapad. Continue bringing out further volumes.
- Study and add literature on Bon Po and Zian, check if some reference is there about Aadinath, Rushabhdev, Ashtapad, Nirgranth- Shraman- Jainism.
- Study and add information and translate references from Tibetan language (Kanjur Tanjur books, Bon Po books & others)
- Geological studies.
- Satellite studies.
- Archaeological studies.
- Government level coordination- India /China / Nepal / USA and other countries like Switzerland / Germany etc.
- Continue research tours & expedition every other year at a scientific level.
- Establish Ashtapad Research Foundation/ by laws / funding.
- Quarterly newsletter to publish or e-mail messages to send.
- Have more meetings / lectures / seminars and exhibitions on Ashtapad.
- Visit other places like Sikkim, Nepal, Mysore, Dharamshala, Tibet, Uttarkashi.
- Study historical background of that time specially political, religious and cultural.
- Construction of Ashtapad Tirth made in gem stones as per description in scriptures at New York and in India.
- Any other suggestions.

Proposed Research Team for Future

I wish to suggest that the following people should make up the next team. If one can coordinate with National Geographic people and Discovery channel people it will be much better.

Geologist	2	Archaeologist	2
Satellite Specialist	2	Interpreter	4
Geography Scholar	1	Coordinator	2
Historian	1	Tibetan Scholar	1
Gemologist	1	Local Scholar	2
Bon Po Scholar	1	Mountain Climber	2
Jain Scholar	2	Photographer	2

6 A report on field trips I and II to locate site for Ashtapad near Kailash in Tibet

P.S. Thakker

Jain Center of America, New York has constructed a temple with a model of Shri Ashtapad Maha Tirth. The center is interested in locating Ashtapad Maha Tirth and Ashtapad Mountain. A research program was undertaken by the center to find out the existence of Ashtapad near Kailash in Himalayas. Two field trips were organized during May-June 2006 and June-July 2007.

Following members joined and helped in the research trips our thanks to all of them

Research trip I- 2006

Standing from left to right:
Vimal Kumar Bordia
Lata Bothara
Umaji Boradia
Niranjana Shah
Dr. Rajnikant Shah
Yogeshbhai Kothari
Dr. Kirit P Gosalia
Bharat Hansraj Shah

Sitting from left to right:
Dr. P.S Thakker
Dr. Jitendrabhai B. Shah
P. Mrigendra Vijayji M.S.
Abhay Kasliwal

Research Trip II- 2007

From Left to Right:
Yogeshbhai Kothari
Dr. P.S. Thakker
Bharat Hansraj Shah
Abhay Kasliwal
Navin Juyal

Ref. Vol. XI Ch. 80 B pg. 4973-5005

For this purpose a team consisting of doctors, engineers, Jain scholars, Sanskrit scholars, persons who visited Kailash thrice earlier and space scientists, along with translators, climbers and professional photographer, was put together. I had the privilege of exploring Kailash area during both the trips.

According to Jain belief, Lord Rushabhdev was the first *Tirthankar* of present age (*Avsarpini*) hence the name is Aadinath. He was an *Arhat*- a liberated soul. In Jain tradition Aadinath is more than a Tirthankar. As a King he taught *Asi*, *Masi* and *Krishi*. Aadinath / Rushabhdev, the first *Tirthankar* of Jainism was said to have attained *Nirvana* at Ashtapad near Mount Kailash in Tibet. In his memory King Bharat Chakravarti, son of Rushabhdev, constructed a temple/ *Sinha Nishadhya Prasad* on Ashtapad. An attempt was made to collect information regarding Ashtapad from scriptures, Acharyas, scholars and local inhabitants which was put together in XX volumes.

There are different opinions regarding the location of Ashtapad Mountain and Ashtapad Maha Tirth. Present status of Ashtapad Maha Tirth is invisible and unknown. The type of temple was *Sarvatobhadra, Chaturmukhi*. Nobody has seen the temple in this shape. Only literary evidences are available. At present the location of Ashtapad Mountain is also debatable. One school of thought is that the Kailash and Ashtapad mountains are same. While other school believes they are different mountains. Since the exact location of Ashtapad is unknown at present one cannot decide which is which.

Shri Bharat Hansraj Shah visited Kailash Mansarovar thrice during earlier years and took photos of the structures which looked like man-made structures. These structures were looking like *Nandi* i.e. Bull, Lion- *Sinha*, *Siddha* or *Yogi Purushas*, etc. which according to him was *Sinha Nishadhya Prasad*. Some of these photographs were published and presented at Indira Gandhi National Center for Arts (IGNCA), New Delhi, in Jan 1999. The various features in the photos are given below. His report appears in this chapter.

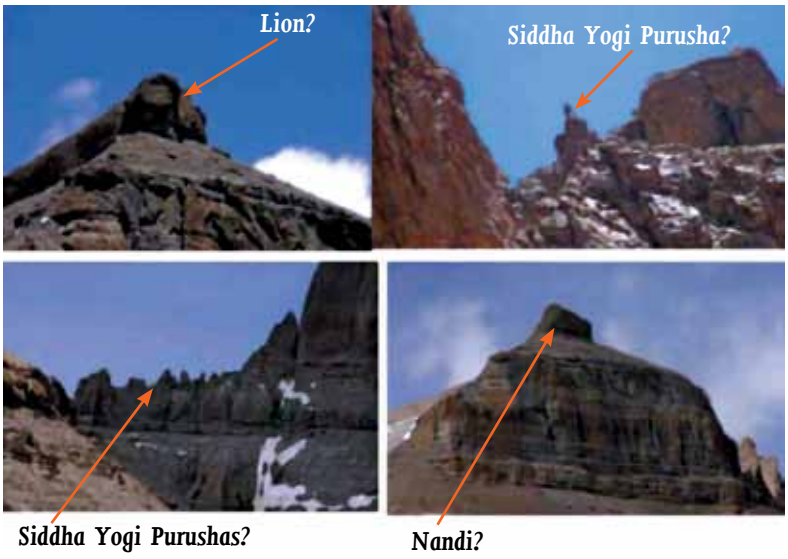


Fig.1: Shows structures which look like man-made in the region near Mount Kailash viz. Siddha Purusha, Purushas, Nandi, Lion etc.

Researchers and pilgrims visit Kailash Mansarovar region in a hope to find out something more and get some new information about Ashtapad. It is believed that it is buried somewhere in this region. It has not yet been located precisely. An attempt has been made by the author under the

guidance of Jain Center of America, New York to locate the same. Author was part of Ashtapad Research Group during May- June 2006 and June- July 2007 field trips to Kailash area.

According to Dr. Rajnikant Shah's report with reference to first field trip one can see that all the travel agents talk and take you to different places for Ashtapad. A traveler-out of hardship of local conditions of three days of Kailash *parikrama*- believes what he is told. Just out of desire and wish to visit Ashtapad, he visits the places wherever travel agents take him, but one should not take for granted that the place is Ashtapad.

During our first and second field trips few of us visited hillock near Darpoche, region around Serlung Gompa and Gyangdrag monastery, 13 Drigung-Kagyu Chorten and Nandi Parvat. Photographs were also taken. From the information gathered, it is believed that there could be nine places where a possibility of Ashtapad could be there. Last tenth one was detected and established by the author.

Probable locations of Ashtapad Mountain and Ashtapad Maha Tirth are as under:

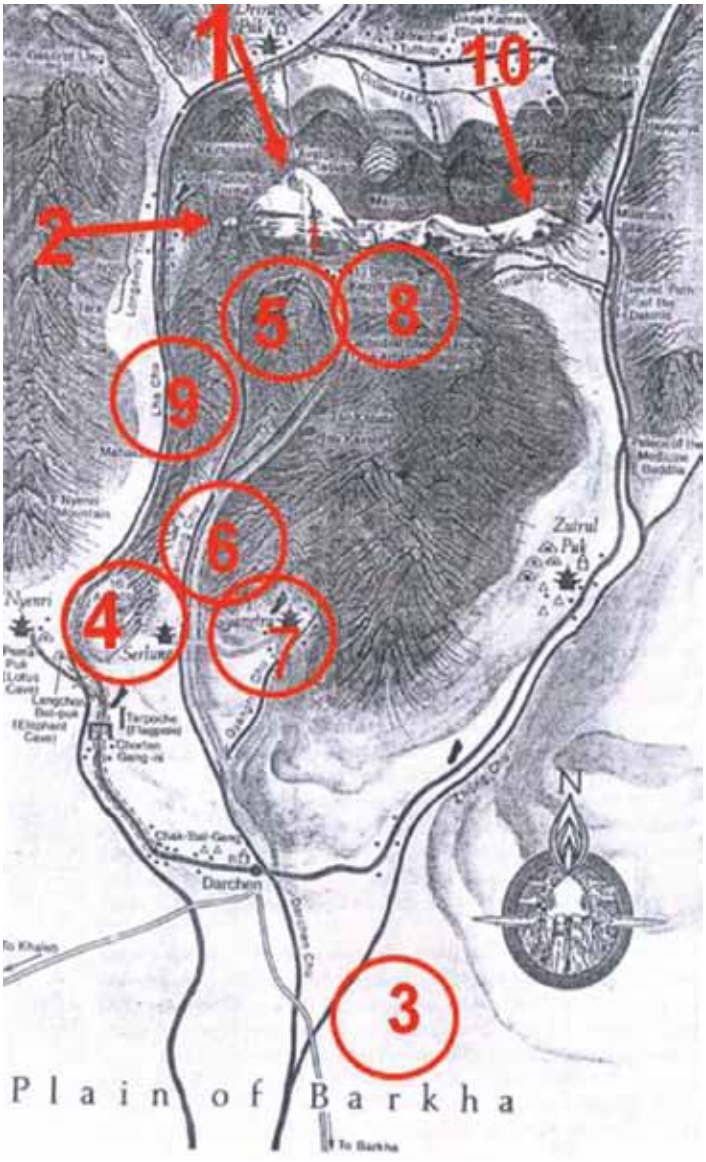


Fig.2: Map showing probable sites of Ashtapad Mountain & Ashtapad Maha Tirth including the site detected using satellite data by the author.

No. 1 on the map (Fig.2) shows Mount Kailash, no. 2 shows Bonari near Kailash, no. 3 shows Barkha plains, no. 4 shows Tarboche, no. 5 shows Nandi Parvat, no. 6 shows mountain between Serlung Gompa and Gyangdrag monastery, no. 7 shows Gyangdrag monastery, no. 8 shows 13 Drigung Kagyu Chorten, no. 9 shows the probable site of Ashtapad known as Gombo Phang or Trinetra or Mahakal, no. 10 shows the site detected using satellite data by the author and known as Dharma King Norsang.

1. Kailash

People believed that Kailash and Ashtapad are not different and Mount Kailash is the Ashtapad Mountain only. In 'Trishasthi Salaka Purush Charitra' by Kalikal Sarvagna Hemchandracharya, Kailash itself is Ashtapad (Ref. 42). John Snelling has written in his book that Kailash is called Ashtapad (Ref. 42). Pranavanand Swami has also mentioned that Kailash is Ashtapad (Ref. 43). From literature we know that it remains covered with snow. It is difficult to climb the Kailash which also matches description found in literature for Ashtapad. Thus the main and first claimant of Ashtapad is believed to be the Mount Kailash itself. But other research workers do not agree with this theory (Ref. 44). According to Jaswant Rai Busa, Ashtapad is different from Kailash (Vol. VIII pg. 3215). Kailash has a steep slope and is covered with snow all over all year around. Where could have been the construction site on Kailash?

Fig.3: Mount Kailash and Bonari

2. Bonari

Swami Pranavanand has mentioned that adjacent to the Kailash peak is situated on its western side a smaller snow-peak called Trijung, which is said to be the abode of Dorje-Phangmo (Ref. 45). This place is known as Bonari (Fig.3).

After visiting the region and looking at the various photographs taken by the members of our Ashtapad research group, and the literature read by me next place came to my mind for probable site of Ashtapad Maha Tirth is Bonari, a small hillock adjacent to Mount Kailash. This matches with the description about Ashtapad Maha Tirth. There are no references found for

this hillock anywhere and no single travel agent or guide is talking about this place as possible site of Ashtapad. But still we might look into this direction and work in future for this place as probable site of Ashtapad. Figure 3 shows the position of Bonari adjacent to Kailash.

3. Barkha Plains

From the descriptions found in literature (Ref. 46), between Mansarovar (Padma Had) and Kailash, about 5-7 miles away from Mansarovar, there is another mountain called Ashtapad. A map also shows the place in Barkha Plains. It is believed that the location of Ashtapad Maha Tirth could be there somewhere in Barkha Plains i.e. between Mansarovar and Kailash (Ref. 47).

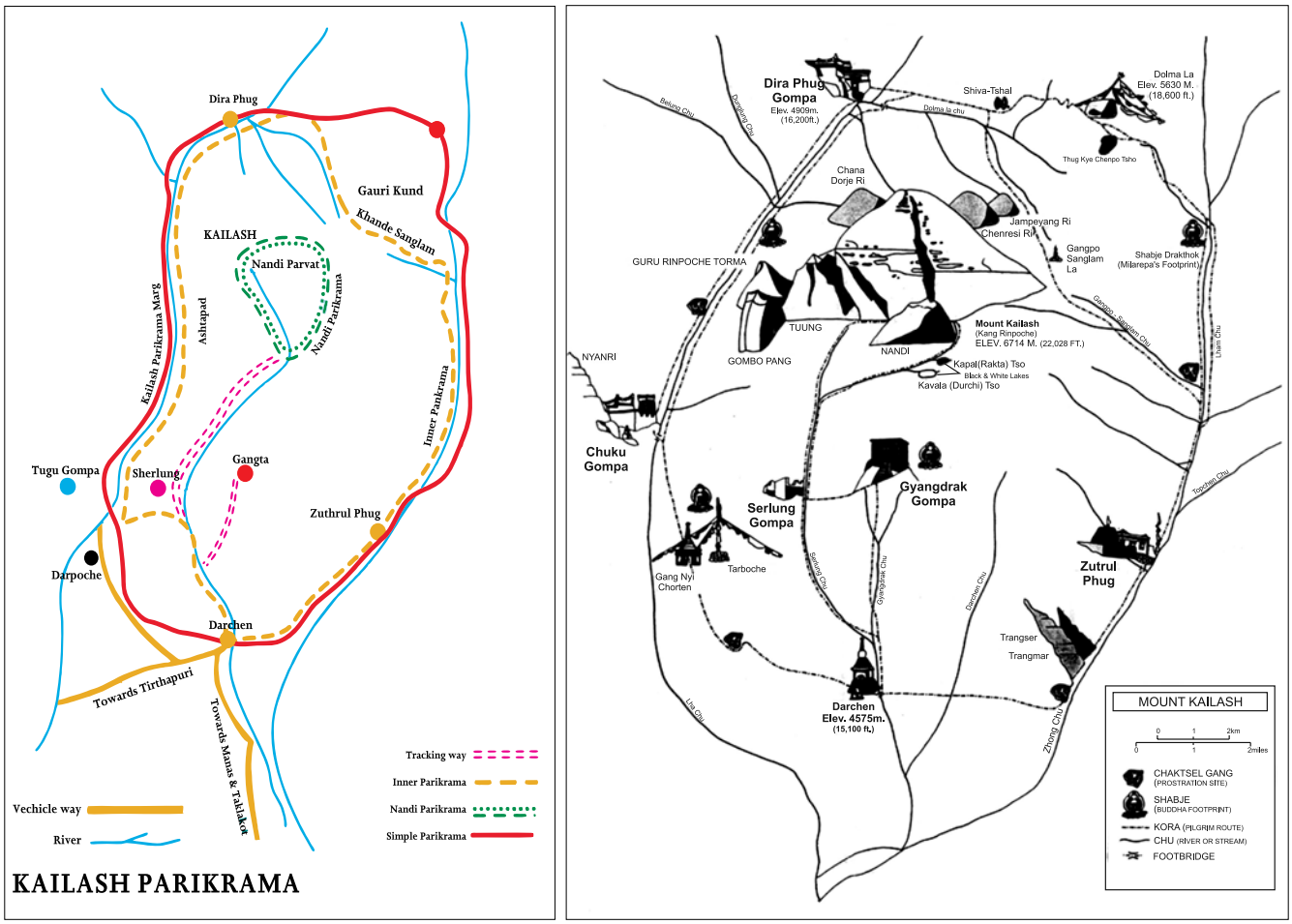


Fig.4: Shows probable site of Ashtapad in Barkha plains.

4. Tarboche

Some people believe that Ashtapad is near Yam Dwar or Moksh Dwar or Tarboche. It is located 200 feet higher than Tarboche on right side opposite to Nyari or Chuksum Gompa. Swami Chidanand and pilgrims accompanying him performed pooja on this Ashtapad. Nalini and Kamlini performed Shiv Tandav dance on this Ashtapad (Ref. 7). Information collected by the Jain Center of America, New York and compiled in the volumes also shows that Tarboche is one of the claimants of probable site of Ashtapad (Ref. 41).

Fig.5: Shows the probable site of Ashtapad near Tarboche where flag pole is there
On Jyeshtha Purnima day annual fair takes place here and people gather to change the flag.

I think this hillock might be considered as probable site of Ashtapad by the locals or pilgrims due to the presence of 16 *Arhats* on nearby hillock. Another map shows sky burial of 84 *Arhats*-enlightened persons on this hillock.

(Ref 41 & 48). Fig.4: Shows the probable site of Ashtapad near Tarboche where flag pole is there and annual fair takes place here. We were there on *Jyeshtha Purnima* day when annual fair took place. People gathered here to change the flag. Fig 5: Shows sky burial of 84 *Arhats*, at Tarboche, shown on the map published by Karto Atelier, Nepal.

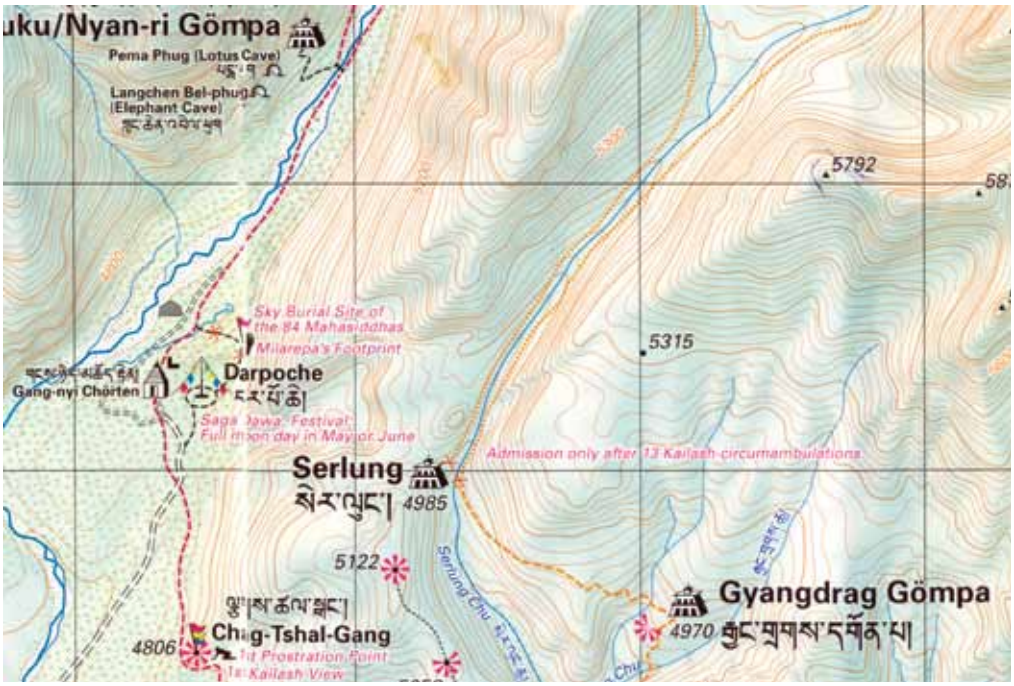


Fig.6: Shows sky burial of 84 Arhats, at Darboche, on the map published by Karto Atelier, Nepal. 1:50,000 scale with contour information.

5. Nandi Parvat

Some people believe that the Nandi Parvat located to the south of Kailash is the Ashtapad. There is Nandi seated at the top of mountain. Some people believe this structure appears as lion and think about this place as Sinha Nishadhya Prasad. Some local guides took pilgrims to show Ashtapad at Nandi Parvat. Information collected by the Jain Center of America, New York and published in volumes also mentions this place as one of the claimants of Ashtapad (Ref. 49). My colleagues from Space Applications Center, Ahmedabad, Dr. S. P. Vyas, Shri Shashikant Sharma and Ms. Yogini Vanikar who visited Kailash Mansarovar during the year 2003 provided ground photograph of Ashtapad which is same as this hillock (Ref. 22, 23, 24). Fig.4: Shows the location of Nandi Parvat to the south of Mount Kailash. Fig.7: Probable site of Ashtapad Maha Tirth and Ashtapad Mountain at Nandi near Kailash - south of Kailash.

Fig.7: Probable site of Ashtapad Maha Tirth and Ashtapad Mountain at Nandi near Kailash- south of Kailash

6. Mountain between Serlung Gompa & Gyangdrag monastery

Some people believe that the Ashtapad Mountain is located in between Serlung Gompa and Gyangdrag or Gangta monastery. Information collected by the Jain Centre of America, NY and published in different volumes also shows on a Map this site as one of the probable site of Ashtapad.(Ref.8). Refer figure-4 for probable sites of Ashtapad Mountain and Ashtapad Maha Tirth between Serlung Gompa and Gyangdrag monastery. Also see figure 8 & 9 which shows area around it.

Fig.8: Shows area between Gyangdrag Monastery and Serlung Gompa

Fig.9: Shows Serlung Gompa and the surroundings

7. Gyangdrag Monastery

A few people believe that the Ashtapad Mountain is the hillock on which Gyangdrag monastery is located. This may be due to the write up on a board which tells that visitors of Jain and Bon Po religion come to this place for meditation. When we visited this area we found many ruins here. Sufficient evidence is not available except the Jain words mentioned on the board, however the board is recent and written in English language, so it cannot be taken as authentic. Shri Abhaykumar Jain and I visited area beyond Gyangdrag Monastery in hope to find out the location of Ashtapad. We found a few ruins of houses and monasteries.

Fig.10: Shows Gyangdrag Monastery and the surroundings

Shri Bharat Hansraj Shah, Dr. Kirit Gosalia, Climber, Photographer and the guide visited another nearby site called Nandi Parvat. It was found that earlier structures believed to be man-made were all natural features: Shri Bharat Hansraj Shah himself has written that those were all natural features and not man-made. (Vol. X pg. 4522 Annexure)

Fig.11: Ruins beyond Gyangdrag Monastery

Remote sensing data from various satellites have successfully been used in the field of archaeology to locate buried structures,towns,cities, Palaeo channels and the course of river Vedic Saraswati in India (Ref. 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, and 40). After coming back from Kailash Mansarovar region after my first trip I started looking at the Indian remote Sensing Satellite (IRS) and Linear Self Scanning sensor (LISS)-IV data of the region and found some rectangle/square structures in the area beyond Gyangdrag monastery. The ruins were found during our visit to the region.

9-March-2004

Fig.12: IRS image showing square structures in the region of Gyangdrag Monastery

19-September-2004

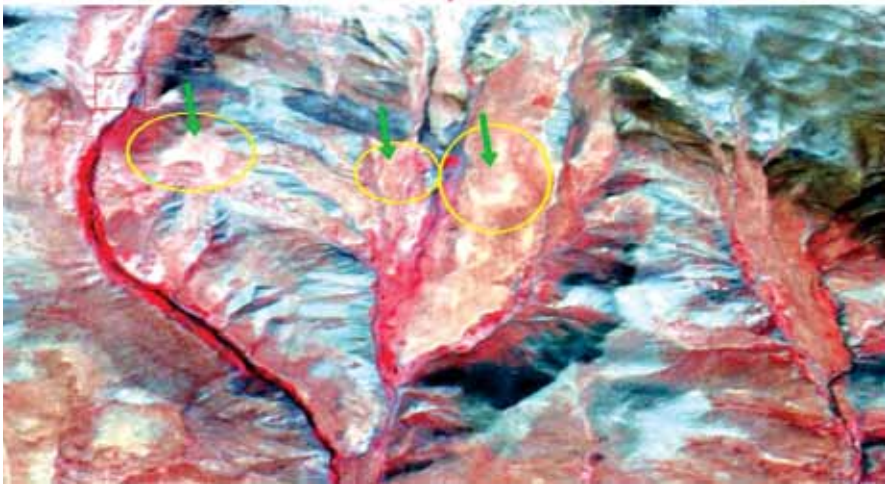


Fig.13: IRS image showing square structures in the region of Gyangdrag Monastery.

13-June-2005

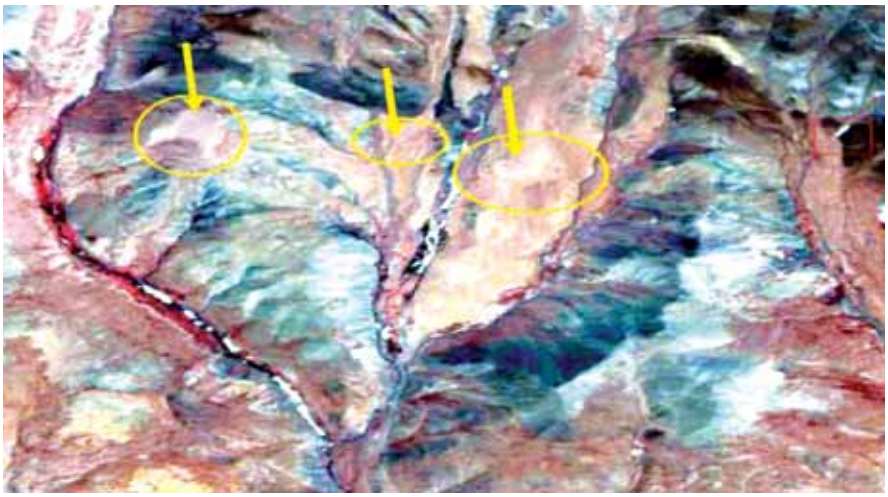


Fig.14: IRS image showing square structures in the region of Gyangdrag Monastery

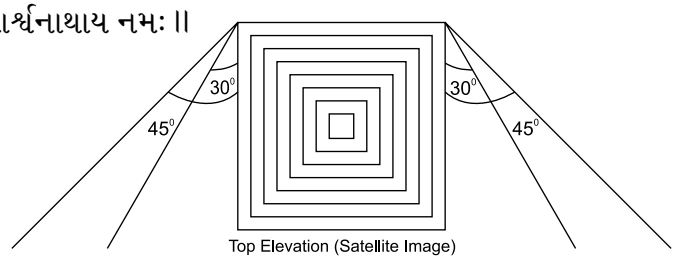
When analysis of IRS LISS-IV data was carried out, I was hopeful to locate Ashtapad Maha Tirth in the region around Gyangdrag Monastery as I was able to see some square or rectangle structures in this on the imagery at three different places as marked by circles on all three images. Sketch of Ashtapad temple sent by Panyas Nandi Ghosh Vijayji Maharaj which was in the back of my mind (Vol. X Pg.4506-07) as given below also indicate the same.

Red, pink and brownish red color, on the images, show vegetation. Buried structures are marked with yellow circles, which indicate dry or semi dry grass. Author has detected, identified and located many archaeological sites in Gujarat, other states in India, Pakistan and Nepal also with the help of satellite data. (Ref. 25-37). If one can see such structures on multi data then the chances of having an archaeological site increases very much.

Panyas Nandi Ghosh Vijayji Maharaj

॥ શ્રી શંખેશ્વર પાર્શ્વનાથાય નમઃ ॥

તત્ર સુશ્રાવક
ડૉ. રજનીભાઈ શાહ
ડૉ. પી. એસ. ઠક્કર સાહેબ,
મુંબઈ લિ. પંન્યાસ નંદીઘોષવિજયગણિનાં ધર્મલાભ



વિશેષમાં આપ અષ્ટાપદના સંશોધન માટે માનસરોવર જઈ રહ્યા છો. ત્યારે મારી દૃષ્ટિએ નીચેના મુદ્દાઓ ધ્યાનમાં રાખવા વિનંતી.

૧. ઉપગ્રહ (સેટેલાઈટ) દ્વારા અષ્ટાપદના ફોટોગ્રાફ્સમાં ૯૦° નો ટોપ એલીવેશન (Top Elevation) તો આવશે જ પરંતુ એ સિવાય થોડા Angle Variation - ૩૦° અથવા ૪૫° પહેલાં અથવા પછીના ૩૦° અથવા ૪૫° પહેલાં અથવા પછીના ૩૦° અથવા ૪૫° ઉપરથી પણ લઈ શકાય કે નહિ ? એ જો શક્ય હોય તો તે પણ લેવડાવવા.

૨. અષ્ટાપદની આસપાસ ખાઈ છે ખરી ? હોય તો કેટલી ઊંડી છે તેમાં પાણી કેટલું છે ?

૩. છેક ટોચના ભાગે ચારેબાજુ મંદિર છે ? કે એ બધી ભગવાનની મૂર્તિ જ છે? એ સિવાય બીજી મૂર્યિઓ છે ખરી ? કયા આકારની છે ?

૪. ભગવાનની મૂર્તિ હોવાનું જણાય તો કેટલી છે ? મૂર્તિનું દ્રવ્ય છે કે જુદા જુદા રત્ની ની ? સેટેલાઈટથી આ વસ્તુ નક્કી થઈ શકે ખરી ? પ્રતિમાનું કદ - સાઈઝ નક્કી થઈ શકે ખરી ?

૫. અષ્ટાપદના આઠ - પગથિયાનું માપ નક્કી થઈ શકે ખરું ?

૬. આખોયે પ્રોજેક્ટ પૂરો થતાં કેટલો સમય જશે ?

૭. ખંભાત શહેરની Satellite Image ભૂગર્ભ પ્રતિમાની માહિતી મળી શકે ખરી ? એ કામ પણ કરી આપવાનું છે.

8. 13 Drigung at the base of Kailash:

Some people believe that Ashtapad Maha Tirth is at the base of Kailash to the south of it were 13 Drigung/Siddhas are there. Some local guides tell pilgrims about this place as Ashtapad. Fig. 15 shows the location of 13 Drigung- Kagyu Chorten to the south of Mount Kailash.

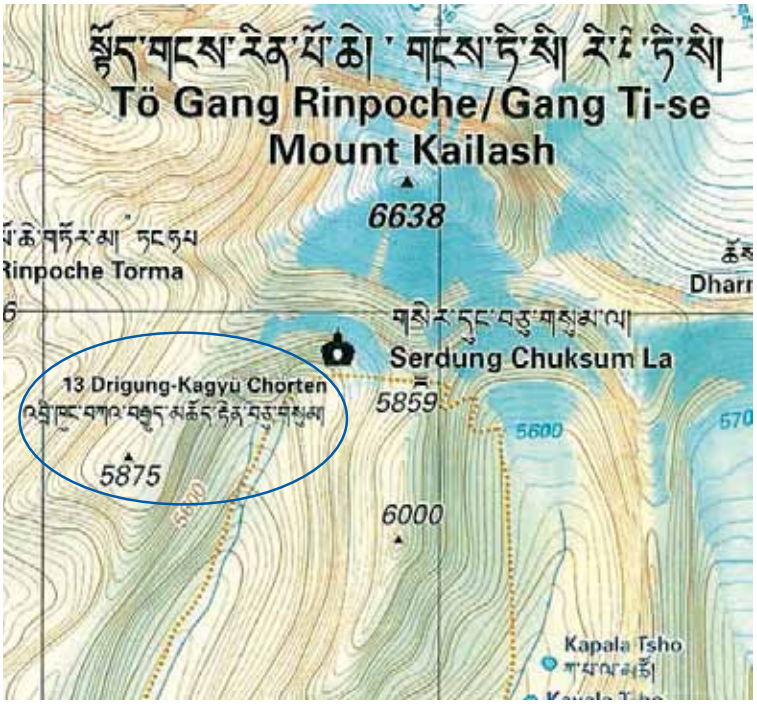


Fig.15: Probable site of Ashtapad Mountain, Ashtapad Maha Tirth at 13 Drigung-Kagyu Chorten and Dharma King Norsang

9. Tri Netra or Gombo Phang or Mahakal

There is a place shown as Ashtapad in the referred map in the volume VIII pg. 3243 & 3313. Same place is shown in a map vol. IV part II pg.1548 which matches with Tri Netra or Maha Kal or Gombo Phang.

Fig.16: Probable site of Ashtapad Mountain and Maha Tirth correlating Gombo Phang on the way to Drira Phuk as a part of Kora-Parikrama

10. Dharma King Norsang

I saw a picture poster, with my colleague, Shashikant Sharma, which was commercially available and bought by him from Tibet. I assumed that the photograph was taken from the south side of Kailash and flight path of helicopter must be from SW to NE i.e. from Darchen side to east of Kailash. I tried to locate the other peak with reference to Kailash with the help of my colleague. We gave names as Kailash and Ashtapad. That time we were not aware of the picture given in Ashtapad volume III (pg. 812).

This was compared with the 1:50,000 scale trekking map of Kailash purchased from Kathmandu, published by Karto Atelier Nepal. After analyzing the data I believe that I am near success in locating Ashtapad with the help of (IRS) and (LISS)-IV data.

The probable site of Ashtapad is located to the south east of Mt. Kailash (Ht. 6638m), at the altitude of Ashtapad that is 5996m. Mt Kailash is known as Gang Rinpoche/ Gang Ti-se. It is 5 km SE of DiraPhuk: 5 km SW of Dolma La. 7.5 km NW of Zutul Phuk: 8km NE of Gyangdrag Monastery: 8.5 km NE of Serlung Gompa. 9 km N/E of Darphoche/ Yam Dwar, or Moksha Dwar. It is 2.5 km to the east of 13 Drigung-Kagyu Chorten: 2 km to the east of Serdung Chuksum La, or 2.5km SW of Gangpo- Sanglam La. The site is easily approachable from Serdung Chuksum La or Gangpo Sanglam La.

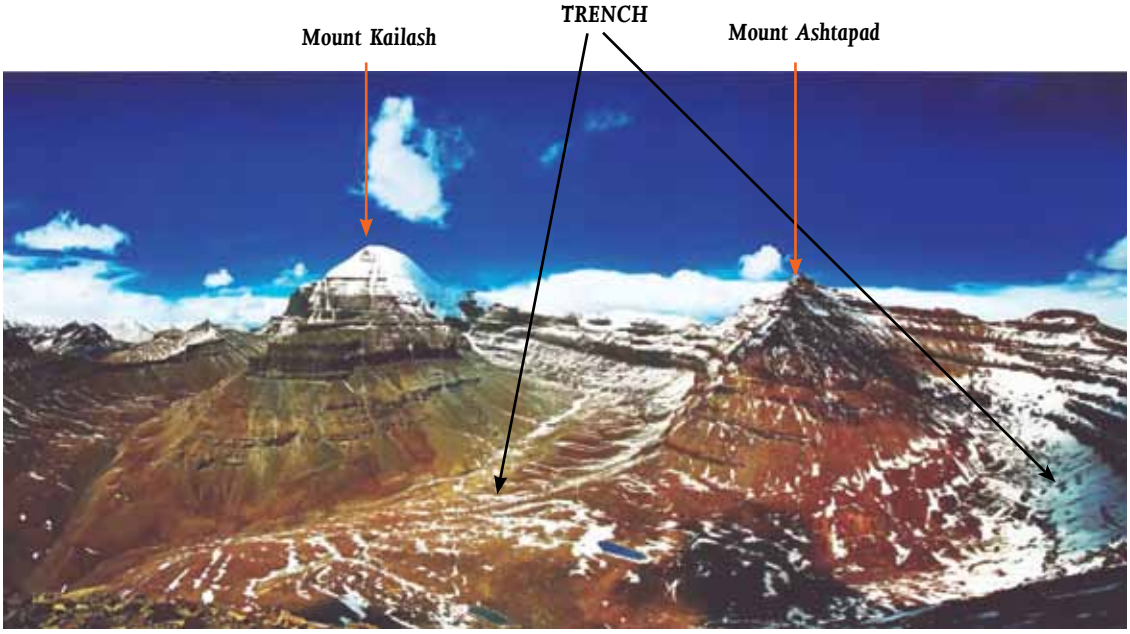


Fig.17: Poster picture commercially available (Aerial view of Kailash and Ashtapad Mountain)

Again I tried to analyze the image in the light of this new reference and found a rectangular/ square structure on the image at this new location. When I referred the contour map which I was having with me, to my utter surprise I found the name of the place as Dharma King Norsang. Looking at the meaning of the word I was sure that I was mostly near the target. Before preparing this final report when I saw the same interpretation by someone else, it was confirmed that my assumption was right (vol. III pg. 812). Then I submitted second interim report to JCA, NY.

Fig.18: Square (if you consider faint part) / Rectangular (if you consider darker area only) structure seen on IRS LISS-IV data (marked by arrows in yellow circle) at the place where Dharma King Norsang is shown in the map.

The photograph shown on vol. III pg. 783 is taken by Shri Subramanyam Swami on 9th September 1981, in which Ashtapad is shown to the south of Kailash. This location might be Nandi Parvat or hillock near Tarboche where 16 Arhats or sky burial of 84 Arhats is located. (Refer fig.5 on pg.85)

Later on I was looking at the description given by Swami Anand Bhairav Giri, which does not match with any of the other eight suggested sites. It perfectly matched with this newly discovered site as a probable location of Ashtapad i.e. Dharma King Norsang.

Anand Giri writes….. "I started at 6:00 o'clock (Indian time) from the Tarchen (Darchen) without any guide and taken oath "do or die", I must touch Kailash in this yatra. I reached at Gangta Gompa at 8:00 o'clock and meet two *lamas* over there. I approached *lamas* with folded hands for Ashtapad *parikrama*. The senior *lama* smiled and asked the junior *lamas* to go alone with me. They offered me Tibetan tea and then we started. The *lama* took my handbag wholeheartedly; I was free to walk, due to deficiency of oxygen I felt very tired. After crossing 2 peaks towards west, we reached Serlung Gompa crossing the Chuksum Chhu (river) which comes down to Tarchen. From Serlung Gompa, a glorious vision of Lord Kailash was seen and I was really amazed. In Serlung Gompa (in two very small rooms) one very old *lama* was living there. I cannot forget his whole-hearted hospitality, though nothing was with him except Tibetan tea and frozen yak milk (called *loseye*). We were there for 15 minutes only and then left for Ashtapad. On the right side is Chuksum Chhu, on the left is Ravana Parvat. Just opposite of Ravana Parvat, there was a big flag (*Maha Dhwaja*) and Nyari Gompa".

On the peak of Ravana Parvat, a big beautiful Shiv ling is there. It can be seen from a distance of few kilometers. The area is fully covered with heap of snow. While walking, I found 4 peacocks there (very big ones) and after walking half a kilometer we found mountain color musk deer (total no. approximately 30 or so). Again after walking half a kilometer at high trekking we found about 15 to 20 peacocks at a distance of 50 feet. After another half kilometer, 50 to 60 musk deer in snow color were seen. There after no such events were visible. Now we started

to climb the mountain. Too much cold, body shaking and shivering with great difficulties and with the help of holy lama I reached at the base of Kailash. There it looked like a ladder and where the heap of snow was stagnant. While crossing this stagnant snow range, a big (about some tons) heap of snow came down with roaring sound. We escaped by the grace of Lord Kailash. Here after the entire route was climbing, tough and dangerous. We crossed and reached Ashtapad cave. (Vol. VII pg. 3046-3047).

Fig.19: Shows the Ravana Parvat near Tarboche to the right side when we travel from Darchen to Tarboche

Fig.20: Ground photo of Kailash base where ladder like structure can be seen.
Area to the east is snow covered and one can see a big heap of snow there.

The site located by me with the help of aerial photograph, (commercially available in poster form at Kathmandu), trekking map and satellite data, is known as Dharma King Norsang. The name also indicates the place of Shiva or Aadinath or Rushabhdev as it indicates Dharma King means King of religion and Norsang means like a lion in human beings. Thus place name also indicates the place of Ashtapad that of Aadinath or Rushabhdev or Shiva. There is a trench surrounding this Ashtapad Site, which also supports my assumption.

One can refer fig. 3 & 36 which are taken from vol. IV part I pg. 1170. This figure shows that Dharma King Norsang is part of Mount Kailash. It remains covered with snow, hence name Dhavalgiri. This matches with probable site and supports the belief that Kailash itself described as Dhavalgiri in literature is Ashtapad. Thus there is no stand for the other nine claimants anymore as Ashtapad.

The site located using satellite data, the Dharma King Norsang seems most appropriate for the site of Ashtapad Mountain or Ashtapad Maha Tirth.

The measurement of Ashtapad temple is one *yojan* in length, two *kosh* in width and three *kosh* in height. (Vol. II pg. 526) Whereas according to Munishri Panyas Nandi Ghosh Vijayji Maharaj the temple or *chaitya* is two *gau* in width and four *gau* in length, and the height is three *gau*. These measurements are that of beginning of the fourth *Aara*. Thus the width may be 200 feet and length may be 400 feet. (Vol. X pg. 4506 and personal communication). There is more work to be done in this direction in the future.

॥ શ્રી શંખેશ્વર પાર્શ્વનાથાય નમઃ ॥

તત્ર સુશ્રાવક તા. ૨૭-૯-૦૬

લિ. પંન્યાસ નંદીઘોષવિજયગણિનાં ધર્મલાભ

અષ્ટાપદ ઉપરના દેરાસરમાં માપ - લંબાઈ - ચાર ગાઉ, પહોળાઈ - બે ગાઉ અથવા ચાર ગાઉ હોઈ શકે. જો દેરાસર ચોરસ હોય તો ઊંચાઈ - ત્રણ ગાઉ, પહોળાઈ - ચાર ગાઉ હોય અને લંબાઈ - બે ગાઉ હોઈ શકે. શું સેટેલાઈટ ઈમેજમાં આવું દેખાય છે ? તેવા ફોટો હોય તો મોકલશો અને ભગવાનની પ્રતિમા મૂર્તિ દેખાય છે કે નહીં ? તે પણ જણાવશો.

Anand Bhairav Giri travelled from Gyangdrag monastery to Serlung Gompa and from Serlung Gompa to the base of Kailash where 13 Drigung Kagyu is there. From the base he travelled to the higher snow covered area which matches with the site of Dharma King Norsang.(Ref. Fig. 2 & 4).

I found the description from volume X pg. 4393 that Ashtapad Tirth is east of Meru Mountain. There were idols of Lord Adishwar and Ajitnath. We can find description in vol. V pg. 2196 that Ashtapad Mountain is covered with snow and is white known as *Dhavalgiri*. One can reach at Ashtapad by walking from Darchen, after crossing 10 to 20 hills.

We also received a letter from Apna Bharat which also shows that Ashtapad was to the east of Kailash and supports my hypothesis.

The place is yet to be confirmed on ground. A detailed study is to be carried out using Geographic Information System and other satellite data. Comparison of the measurement of the temple found from the satellite image and measurement found from literature or Jain Acharyas will be carried out in future with the help of Digital Elevation Model (DEM) generation and Geographical Information System (GIS) analysis.

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7 A reconnaissance mission to locate the Ashtapad Temple

KM-III Expedition Report[1] - June 4 to June 30, 2009

John Vincent Bellezza

Introduction

The objective of the KM-III Expedition was to determine the precise location of Shri Ashtapad, the most elusive of Jain temples. According to Jain scriptures, the first of the 24 *Tirthankar* Shri *Rushabhdev*, the Aadinath Bhagwan, went atop Mount Kailash for *sanlekhna* (fasting until death). It was at Mount Kailash that Lord Aadinath achieved the glorious Nirvan. To honor and commemorate his father's enlightenment, King Bharat Chakravarti, the eldest of 99 sons, is believed to have constructed Shri Ashtapad, also called the Ratnamay palace, somewhere at Mount Kailash. In Jain literature, Shri Ashtapad is recorded as being eight-stepped, four-sided and probably very extensive. This marvelous edifice is said to have housed the Shri Chovisi (sculptures of the 24 *Tirthankar*) in the *gabhara* (main place of worship).

Unfortunately, the identity and location of Shri Ashtapad have been lost to time. Jain scholars cite timescales measured in the thousands or millions of years ago to account for its passing, complicating any attempt at scientific analysis. As I understand it, there is also a school of Jain thought which holds that accounts about Shri Ashtapad are metaphorical in nature, encapsulating high spiritual truths, rather than a literal description of a temple edifice. This doctrinal perspective seems to be supported by the words of Bhagwan Mahavir 599-527 BCE (before common era), the 24th and final *Tirthankar*, when he tells his Jain *tapas* (saints engaged in austerities) that the one who scales Mount Ashtapad and offers prayers there to all the *Tirthakara* will surely attain *moksha* (ultimate release). In his momentous sermon, Mahavir alludes to the identification of Shri Ashtapad as a natural mountain.

The findings of the KM-III Expedition encourage the view that Shri Ashtapad is Mount Kailash itself, rather than a man-made temple of epic proportions or otherwise. The reconnaissance conducted yielded absolutely no physical evidence of a Jain monumental presence at Mount Kailash in any chronological period. This absence of discernable Jain ruins and relics occurs in a region rich in Bon and Tibetan Buddhist cultural materials, the monuments and artifacts

1. The KM-III Expedition was organized and funded by the Ashtapad Research International Foundation, USA. In particular, the time and assistance of Shri Dr. Rajnikant Shah were absolutely essential in the successful launching of the research expedition. Dr. Shah and Dr. Mrs. Shah most generously provided their financial backing and moral support to the members of the KM-III Expedition. It has been a rare privilege to work with such exceptional individuals.

Ref. Vol. XIX Ch. 143 A Pg. 8275-8297

that make up the fabric of Upper Tibetan civilization. Desultory finds of Stone Age lithic artifacts aside, the earliest archaeological horizon detectable at Mount Kailash belongs to the so-called Zhang Zhung civilization, a broadly defined cluster of cultural orders spanning the first millennium BCE and first millennium CE (common era) over a large area of Upper Tibet.

The most salient physical feature of the Zhang Zhung civilization at Mount Kailash is the remains of an extensive network of all-stone corbelled residences known in the native parlance as *Dokhang* (Tibetan = *rdo-khang*). These robustly built, semi-subterranean edifices dot the slopes of Mount Kailash and its surrounding ridges to a maximum height of 5470 m elevation. These are among the highest archaeological remains found anywhere in Upper Tibet. They also constitute the loftiest permanent residences built anywhere in the world, past or present. An impressive physical feat to be certain.

In other parts of Upper Tibet, the chronometric analysis of organic remains found inside standing *Dokhang* and what appear to be the foundations of *Dokhang* were carried out separately by Professor Mark Aldenderfer and I.[2] These test results indicate that *Dokhang* were already being built by the middle of the first millennium BCE. While none of the all-stone corbelled residences at Mount Kailash have undergone chronometric analysis, we can infer that this unique form of highland settlement came to the region quite early. This is supported by Bon literary accounts that describe the lap of Mount Kailash at Gyangdrag (Tib. = rGyang-grags) as the very first capital of the prehistoric Zhang Zhung kingdom.

Although the ancient ruins of the indigenous Zhang Zhung civilization dominate the flanks of Mount Kailash, this by no means denies an ancient Jain cultural presence at the holy mountain. The predominance of Zhang Zhung cultural materials merely signals that the Jains did not leave monuments behind at Mount Kailash. The scope for the Jains having reached Mount Kailash no later than the time of Mahavira remains strong, for cultural exchanges between the Indian Subcontinent and Upper Tibet are documented in both Indian and Tibetan literature. Bon ritual and meditative texts are replete with Sanskrit mantras and terms thought to have reached Zhang Zhung long before Vajrayana Buddhism washed over the Tibetan Plateau.

While Bon claims of religious intercourse with prehistoric India remain to be satisfactorily assessed, the overall geographical and archaeological picture supports them. The two sides of the Great Himalayan divide offer differing but complimentary ecological resources and cultural products, a very powerful incentive for trade and cooperation. Furthermore, the religious sentiments of Indian people have been tied up with the Himalaya for a great deal of time. The suite of textual, utilitarian and religious factors argue strongly that peoples such as the Jains have filtered over the Himalayan barrier for many centuries, carrying ideas, goods and spiritual inspiration along with them.

2. See: Mark Aldenderfer, 2003. "A New Class of Standing Stone from the Tibetan Plateau" in The Tibet Journal, vol. 28, nos. 1 and 2, pp. 3-20. Library of Tibetan Works and Archives: Dharamsala.
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Geographic Scope of Exploration

In conjunction with Shri Dr. Rajnikant Shah and a number of Jain textual scholars it was decided that the focus of exploration on the KM-III expedition should be the various valleys and ridges situated on the south side of Mount Kailash (Tib. = Ti-se / Gangs rin-po-che). Among Tibetans this area is known as the inner circuit (Tib. = nang-skor).

According to Jain scholars, the inner circuit is the most likely and compelling location for the Shri Ashtapad temple. Jain textual and cultural indications pointing to the south side of Mount Kailash as possessing much scope for exploration is supported by its optimal geographic situation and Tibetan religious history. Spectacular natural beauty notwithstanding, the inner circuit of Mount Kailash boasts many heightened geomantic qualities. No other location affords such open and immediate views of the massif. The south side of Mount Kailash also receives maximum solar exposure, a key natural endowment in a brutally cold climate. Moreover, there are a surprising number of cave sites, valley branches, flats, and water sources lying in the lap of the mountain fit for human habitation.

The importance of the south side of Mount Kailash is also reflected in Bon scriptures. Great Zhang Zhung saints such as Anutrak and the founder of Bon himself, Shenrab Miwo, are supposed to have meditated and taught on the south side of Mount Kailash. The first capital of Zhang Zhung according to some Bon sources, Gyangdrag Yulojon (Tib. rGyang-grags g.yu-lo-Ijon), sits right in the middle of the inner circuit, clearly sealing its status as an exceptionally significant location.

The extremely high regard in which the south side of Mount Kailash was held by the early Bon Po was not lost on their Buddhist successors. In the 11 century CE, a supposed final showdown between the Buddhist yogin Milarepa and his Bon Po rival Naro Bonchung took place on the south side of the mountain. The central vertical fissure on the south face is said to have formed when Naro Bonchung's flying drum tumbled out of the sky during the battle. In the late 12th century CE, the Drigung Kargyu subsect established Serlung and Gyangdrag monasteries in the inner circuit, consolidating Buddhist control.

Given its promising placement, the south side of Mount Kailash was systematically reconnoitered on the KM-III Expedition, beginning on the west end and continuing around to its eastern extremity. While it was not possible to cover every bit of the inner circuit in the five days allotted to its exploration, by visiting strategic points across its reach, a comprehensive picture of the area was assembled.

Exploration Findings

After more than a week of travel and acclimatization, the five members of the KM-III expedition finally entered the inner circuit of Mount Kailash on June 16. Our first camp was established near Serlung monastery.[3] Without losing any time we proceeded along the ridgeline west of Serlung monastery. This ridgeline separates the outer circuit of Mount Kailash along the Lha Chu river from the inner circuit. This long outlier is composed of two lesser peaks commonly referred to as Shri Ashtapad by some Jain pilgrims and Shiva Lingam, a peak capped by a natural rock tower situated next to the Kailash massif.

3. Due to physical fitness and motivational factors, the hard work of combing the peaks and valleys of the Mount Kailash circuit fell largely to Ms. Sally Walkerman and I. Thanks to years of training and experience, we had the requisite mental and physical reserves demanded of the work. Those leading a sedentary urban lifestyle are hardly in a position to conduct such operations.

1. The so-called Shri Ashtapad peaks

On June 16, four members of the team scaled the lesser of the two so-called Shri Ashtapad peaks (31° 01.15' N. lat. / 81° 16.76' E. long. / 5330 m).[4] Returning on June 20, Ms. Walkerman and I made it to the summit of the higher so-called Shri Ashtapad peak (31° 01.90' N. lat. / 81° 17.13' E. long / 5670 m). There were absolutely no archaeological ruins or other signs of human modifications on the summits of the so-called Ashtapad peaks. This is not surprising given the highly exposed nature of these locations. They are too wind-swept, dry and rocky to have made ideal loci of permanent human settlement.

The higher of the two popularly designated Ashtapad peaks provided a fine aerie from which to survey the high ground around the Serlung valley. From this position we could look directly over toward the summit of Shiva Lingam and the peak known to Indians as Nandi. Using our field glasses we determined that these summit ridges are also devoid of ruins. They are simply too high, windswept, cold, and far from water to have been developed for permanent settlement. Their talus-strewn summits are subject to below-freezing weather every day of the year, an impossible environment in which to build temples or any other substantial man-made structures.

Nevertheless, next to the so-called lesser Ashtapad mountain there is a ruined *Dokhang* settlement consisting of 16 or 17 all-stone corbelled residences. This site is known as Lungten Phuk (Tib. = Lung-bstan Phuk).[5] Lungten Phuk occupies a long, steeply inclined ravine sandwiched between the outer and inner circuits of Mount Kailash. There is still a spring fed stream at the lower end of the site. In ancient times, water is likely to have been more plentiful, possibly extending up to a higher series of *Dokhang*. Lungten Phuk is protected from the worst of the region's weather. The so-called higher Ashtapad Mountain blocks the site from the northern winds coming off the glaciers of Mount Kailash, a vital consideration. Without exception, the Zhang Zhung archaeological sites around Mount Kailash have the same protected physical aspect. By shutting out northern winds and taking full advantage of a southern exposure, sites like Lungten Phuk are endowed with a relatively amenable microclimate. This is certainly not the case with isolated peaks such as the so-called Shri Ashtapad mountains: they bear the full brunt of a bitterly cold climate.

During KM-III, Ms. Walkerman and I discovered a ruined *Dokhang* at Lungten Phuk situated higher than those discovered on an earlier archaeological survey of the site. Designated DK17, this ruined all-stone corbelled structure measures 8.2m x 9m (31° 01.46'N. lat. / 81° 16.74'E. long. / 5400m). It appears to have consisted of three tiers of tiny, windowless rooms in the typical *Dokhang* style of design and construction. DKN is poised on a narrow shelf that rises above the towering cliffs on the east side of the Lha Chu valley. This is the most spectacular of locations invested with a geomantic perfection that few other ruins at Mount Kailash can rival.

4. The geographic coordinates given in this report are uncalibrated GPS values. These measurements were made without the benefit of a base station that could furnish absolute readings.
5. This archaeological site and many others found in Upper Tibet are the subject of study in a two volume work entitled Antiquities of Zhang Zhung. It is being prepared for online publication by staff at the University of Virginia under auspices of the Tibetan & Himalayan Digital Library.

The existence of Lungten Phuk establishes that the southern flanks of the so-called Shri Ashtapad mountains were indeed selected for permanent habitation by the early Bon Po of Zhang Zhung.[6] Moreover, the east side of the so-called greater Shri Ashtapad mountain is where the Sheldra (Tib. = Shel-'dra) site is located.[7] The all-stone corbelled structures of Sheldra occupy deep fissures that run horizontally across a large escarpment. Lungten Phuk and Sheldra represent the same Zhang Zhung cultural grouping. No Jain cultural materials have come to light at these archaeological sites.

2. Serdung Chuksum

By marching up the Serlung valley it is possible to reach the very base of the Mount Kailash massif. This is the most inner aspect of the holy precinct, the place where devotees can touch the very fabric of the holy mountain. Sheltered in a narrow fissure in the lower portion of the massif is a line of 13 stupas belonging to the Drigung Kagyu subsect. This highly revered site is known as Serdung Chuksum (Tib. = gSer-gdung bcu-gsum).

The reliquary shrines of Serdung Chuksum once contained the holy relics of Dringungpa hierarchs, but these sacred receptacles were desecrated in the Chinese Cultural Revolution. The Bon Po maintain that the 13 stupas of Serdung Chuksum once belonged to them. When the Bon Po were ousted from Mount Kailash with the formation of the Guge-Purang kingdom in the 10 and 11th centuries CE, all their holy sites were requisitioned by the Buddhists. Serdung Chuksum (also known as the 'neck of Mount Kailas') is apparently where the Bon Po concealed scriptures during various waves of persecution, but this cannot be positively confirmed.

No residential ruins of any kind were found at Serdung Chuksum. At 5800 m above sea level, this site falls well outside the zone in which human beings can comfortably inhabit. It is extremely cold and the air very thin at this elevation. Even the inhabitants of Zhang Zhung, who were eminently well adapted to their highland environment, did not establish their *Dokhang* at such a high elevation.

There are bas relief carvings of prayers and deities and sculpted clay votive plaques at Serdung Chuksum as well as at other sites around Mount Tise. These are well-known Buddhist religious emblems and should not be confused with Jain cultural materials.[8]

The heads of the two branches of the Serlung valleys were at one time glaciated. This is

6. The term ' early Bonpo' refers to the followers of archaic religious traditions, rather than an institutionalized religion like that of today.
7. For information on this site see John V. Bellezza, 2002. *Antiquities of Upper Tibet: An Inventory of Pre-Buddhist Archaeological sites on the High Plateau*. Delhi: Adroit.
8. It has come to my attention that certain Jains now believe that the mam idol installed in the Choku monastery (Tib. Chos-sku) is actually one of theirs. This is certainly not the case. This stone representation of the Dharmakaya aspect of the Buddha is one of the most famous statues in all of western Tibet. It is one of 'three brothers' revered by the Tibetans for centuries. Many native folktales surround these 11' century CE idols. In the same vein, I understand that there are certain individuals who are artificially linking Jain Sanskrit terms with Bon terms rendered in the Zhang Zhung and Tibetan languages. One example will suffice to make my point: the Jain *taparishi* being related etymologically to Ta-pi hri-tsa, a Zhang Zhung saint of the 8th century CE. In order to establish such linguistic links one would first have to show that the extinct Zhang Zhung language was influenced by Indie languages such as Sanskrit. At this juncture in comparative linguistic research, this is far from certain.

proven by the existence of terminal moraines and other glacial features. As a result, there are no monumental remains in the valley bottoms, as these areas were once covered in thick ice or prone to flooding. The same barren aspect goes for Tsho Kavala and Tsho Kapala, two tiny glacial tarns nestled on top of a lateral moraine. Their location amid what was once a glacier, and their fierce climate, made them unfit for permanent human habitation. Due to the loss of ice, these bodies of water are on the verge of disappearing.

Ancient human habitation at Mount Nandi (divides the two branches of the Serlung Chu river) is represented by a lone *Dokhang* discovered during KM-III at the southeastern foot of the mountain. This ruined all-stone corbelled residence measures 9.8 m x 8.5 m (31° 02.16' N. lat. / 81° 18.24' / 5330 m). It sits atop a narrow rocky shelf and is protected from the icy winds of the Kailash massif by Nandi. Its insulated geographic aspect permitted it to occupy a location further up valley than any other *Dokhang* at Serlung.

There has been some speculation among Jains that the higher reaches of Mount Nandi (6000 m) may be some kind of gigantic ancient temple. This type of speculation can also be put to rest. The weird and wonderful shapes and forms of Mount Nandi were sculpted by nature, not the hand of humans. A close visual examination easily bears this out. As pointed out in an article entitled "Geological investigation of rock sculptures around Kailash Mountain", by Navin Juyal and P.S. Thakker, these formations were laid down during the Ecocene and Miocene eras, some 5 to 35 million years ago. Mount Kailash and Mount Nandi and other outliers were shaped by glacial action. The conglomerates that make up these mountains are too soft, irregular and crumbly for carving and massive building.

3. Gyangdrag

To the east of Serlung is the branch valley known as Gyangdrag. Above the Buddhist monastery of the same name is a large amphitheatre-shaped valley containing the carcasses of more than 30 *Dokhang*. The high level of settlement in this sector reflects its status as a probable capital of Zhang Zhung. The Gyangdrag amphitheatre is an ideal location for the placement of an ancient settlement. It is well protected from harsh northern winds and it has a warm southern attitude. There are also permanent water sources at Gyangdrag, something not to take lightly in the arid conditions of western Tibet. Furthermore, stones for building the ancient all-stone residences are in ample supply in the area.

During the KM-III explorations, Ms. Walkerman and I discovered three more *Dokhang* in the vicinity of Gyangdrag. The most interesting of these is situated at the highest elevation of any ancient residence at Mount Kailash, and for that matter, in all of Upper Tibet (31° 01.13 ' N. lat. / 81° 17.94' E. long. / 5470 m). Only measuring 4 m x 7.5 m this highly deteriorated ancient residence (designated UW-XIX) was built on a rocky bench along the rim of the Gyangdrag amphitheatre. It is perched 70 or 80 m higher than the next highest *Dokhang* in the area.

While combing the hillsides of Gyangdrag for any signs of Shri Ashtapad we reached a maximum elevation of 5580 m, more than 100 m higher than the highest *Dokhang*. At this elevation exposure to the elements is extremely intense, as it is above the rim of the natural amphitheatre.

This elevation supports much less vegetation and the ground is far less stable than lower-lying

areas. Because of these physical factors, and possibly physiological constraints as well, permanent human habitation did not take root above 5500 m anywhere in Upper Tibet.

4. Dharma King Norsang

East of the Gyangdrag amphitheatre there is a relatively long and narrow valley, which is accessible from Gyangdrag by traversing a series of steep slopes. At the head of this valley is an outlier called Dharma King Norsang (Tib. Chos-rgyal nor-bzang). During our reconnaissance, Ms. Walkerman and I reached a highpoint in the middle of the Dharma King Norsang valley (31° 01.09' N. lat. / 81° 19.62' E. long. / 5500 m). From our vantage point high above the valley we could survey rectangular summit structures, identified by Dr. Thakker on an earlier expedition as possible anthropogenic remains. These structures turned out to be natural rock formations. Other formations in the Dharma King Norsang valley proved just as unpromising.

Unlike places where archaeological traces are found, there are no local accounts of man-made remains in the Dharma King Norsang valley. According to the oral tradition of the native residents of Mount Kailash (known as Kangriwa), this valley was left undeveloped in ancient times. The lack of sites with cultural and historical value in the locale is reflected in the absence of walking trails and Tibetan religious monuments (such as stupas, cairns and *mani* walls). For reasons that are not entirely clear, the ancients ignored the Dharma King Norsang valley, founding their permanent residences in alternative locations. One factor may be that direct views of the Kailash massif are not available from here.

On the basis of an examination of rather low resolution satellite imagery it was also suggested by Dr. Thakker that a location among the glaciers of Dharma King Norsang could be a possible site of the Shri Ashtapad temple ruins. On KM-III this was deemed highly unlikely given the impossible nature of the terrain and climatic conditions. As noted, the ceiling of ancient permanent habitation at Mount Kailash and all of Upper Tibet is below 5500 m. The extremely high elevation and harsh conditions of the upper Dharma King Norsang valley are not and were not amenable to human colonization. This permanently frozen zone of moraines and ice is geologically unstable and practically devoid of vegetation. The climatic trend in the Late Holocene (4000 years before present to recent times) in Tibet has been to drier conditions. Glaciers have been generally receding, and this holds true for the Mount Kailash region, as the geological evidence demonstrates. In the past, the glaciers and ice fields of Mount Kailash were more extensive than they are today, rendering permanent settlement in the heads of the branch valleys impracticable.

5. Drira Phuk

After completing the reconnaissance of the inner circuit of Mount Kailash, four expedition members embarked on a round of the outer circuit. On several past expeditions, I surveyed Zhang Zhung ruins situated around the outer circuit near Choku, Dzutrul Phuk, Menla Phobrang and other locations. These sites are all composed of *Dokhang*, the signature architectural form of ancient Upper Tibet.

On the KM-III expedition, as time was limited, it was decided that Ms. Walkerman and I would reconnoiter the area around Drira Phuk (Tib. = 'Bri-ra Phuk), something left undone on previous

expeditions, rather than revisit Zhang Zhung sites that were already surveyed. With the aid of local monks, we discovered the vestiges of an extensive *Dokhang* settlement on the rocky slopes above the Buddhist monastery. In total, we located 16 such structures hidden among hollows and boulder fields. Scores of inhabitants must have occupied this site before 1000 CE, perhaps for many centuries. In the Bon tradition, Drira Phuk is connected to the theogony of the chief Zhang Zhung god, Gekhoe.

Conclusion

After the systematic exploration of the inner circuit of Mount Kailash, it can be stated that Shri Ashtapad, in the form of a Jain temple complex, does not exist there. The thorough survey of the outer circuit of Mount Kailash on multiple expeditions also leads me to conclude that no Shri Ashtapad temple exists on any flank of Mount Kailash.

Absolutely no physical evidence for the existence of Shri Ashtapad as a temple has been detected at Mount Kailash. Having systematically charted the Zhang Zhung ruins at Mount Kailash, I am keenly familiar with their morphological characteristics, and could eliminate them from our search. Yet, no alternative archaeological sites (save for Buddhist ones) could be discerned in the region. Shri Ashtapad, had it existed, might be represented in diverse structures and objects, as obscure as they may be. Its signature or footprint would be in the form of earthen mounds, rocky tumuli, platforms or other regular features, depressions, wall traces, the outwash of architectural debris, human burials, artifacts, etc. However, no such signs were detected during the KM-III Expedition or on earlier archaeological surveys of Mount Kailash.

The extremely thin and poorly developed alpine soils of Mount Kailash tend to keep archaeological remains on or near the surface. Zhang Zhung residential and ceremonial ruins, including tombs, are usually readily detectable on the surface. There is not an alluvium or other deep substrate to easily engulf ruins, as in lower climes. Of course, it is possible that landslides or other catastrophic geomorphologic changes obliterated certain archaeological assets, rendering visual detection impossible. Nevertheless, the inhabitants of Zhang Zhung were skillful builders. They chose sites that would be protected from floods and avalanches, sites with a stable substrate and an amenable aspect. As a result, traces of them still exist today. Why would the ancient Jains chose lesser sites? They would not build on glacial moraines, flood plains and unstable slopes, locations that would imperil anything constructed upon them.

As the archaeological evidence demonstrates, building a temple above 5500 m, on Aeolian slopes and summits, was also not a viable alternative. Environmental conditions at these extreme elevations preclude any such construction. Not even the people of Zhang Zhung built at these heights, and none were better adapted to the high elevation environment than them.

The ancient inhabitable zone around Mount Kailash is between 4700 m and 5500 m, the highest homeland anywhere in the world (since circa 1000 CE, permanent settlement has been reduced to below 5100 m). Living and working at these heights requires special physiological adaptations and cultural innovations. The contemporary Tibetans are a case in point: their large lung capacity, relatively short extremities, hyper-oxygenated blood and other physiological adaptations make them superbly suited to living on the high plateau. Their traditional diet

rich in animal products, style of heavy dress and strong emotional bearing finely suit them to life at high elevation as well.

The ancient Jains, a lowland, tropical vegetarian people, would not have been as well acclimatized to the Mount Kailash environment as the indigenous peoples. This is not to say that individual Jain *munis* were not capable of great physical feats, they most certainly were, but as a group, the Jains were not physiologically well suited to living and working at Mount Kailash.

Temple building requires engineers, logisticians, cooks, artisans, and servants, most or all of which would have had to have been brought from the Subcontinent. They would not only have had to acclimatize but reach full productive strength, an unlikely prospect given the nature of the Tibetan environment. Many materials for the construction of a great Jain temple would have had to be transported up from the Indian Subcontinent, a logistical prospect.

Although I am not qualified to offer a textual analysis of Jain textual accounts of the Shri Ashtapad temple, I shall raise a few critical questions for consideration. The sheer size and opulence reputed to have characterized Shri Ashtapad do not seem in keeping with the physical constraints of the Mount Kailash area, an austere montane environment. Even a much more modest structure of traditional Jain architectural design seems incongruous with the physical setting of Mount Kailash. With its extreme cold and quite heavy snowfall, a temple with open plan architectural features designed for the tropical world would not be in keeping with local conditions. However, this is what is described in the texts. By contrast, the *Dokhang* of Zhang Zhung were bunker-like affairs, set deeply into the ground with few windows or doors.

The lack of physical evidence for a Jain temple is compounded by the absence of a native Tibetan tradition for its foundation. Archaeological sites around Mount Kailash are known to a small handful of native elders at the holy mountain. These sites all belong to the Zhang Zhung cultural horizon and contain nothing palpably Jain or Indie in cultural orientation. Moreover, while Jains (known as *gcer-bu*) are noted in the philosophical treatises of the Bon Po (and Tibetan Buddhists), they are not mentioned historical narratives. In other words, there are not tales of the Jains and ancient residents of Mount Kailash and Zhang Zhung meeting and interacting. This does not mean that such encounters did not occur, but that they are not central to the Bon historical dialogue.

Mount Kailash was a Zhang Zhung stronghold, supposedly, even its first capital. Any visitation by ancient Jains would have had to be approved by the warlike inhabitants of the region. Even if the two groups became friends, it does not seem likely that the Zhang Zhung inhabitants would have countenanced the construction of an alien temple amid one of their most important political sites.

There has also been some speculation that Shri Ashtapad was founded before the rise of the Zhang Zhung cultural horizon circa 1000 BCE. Prior to this period, as in Kashmir or Swat, the inhabitants of western Tibet appear to have lived a Neolithic or New Stone Age existence, rearing livestock, farming in certain places and hunting. There appears to have been little scope for the establishment of Bronze Age temple complexes prior to 1000 BCE in Upper Tibet, but I hasten to add that this remains to be proven. Still, this begs the question: whatever its

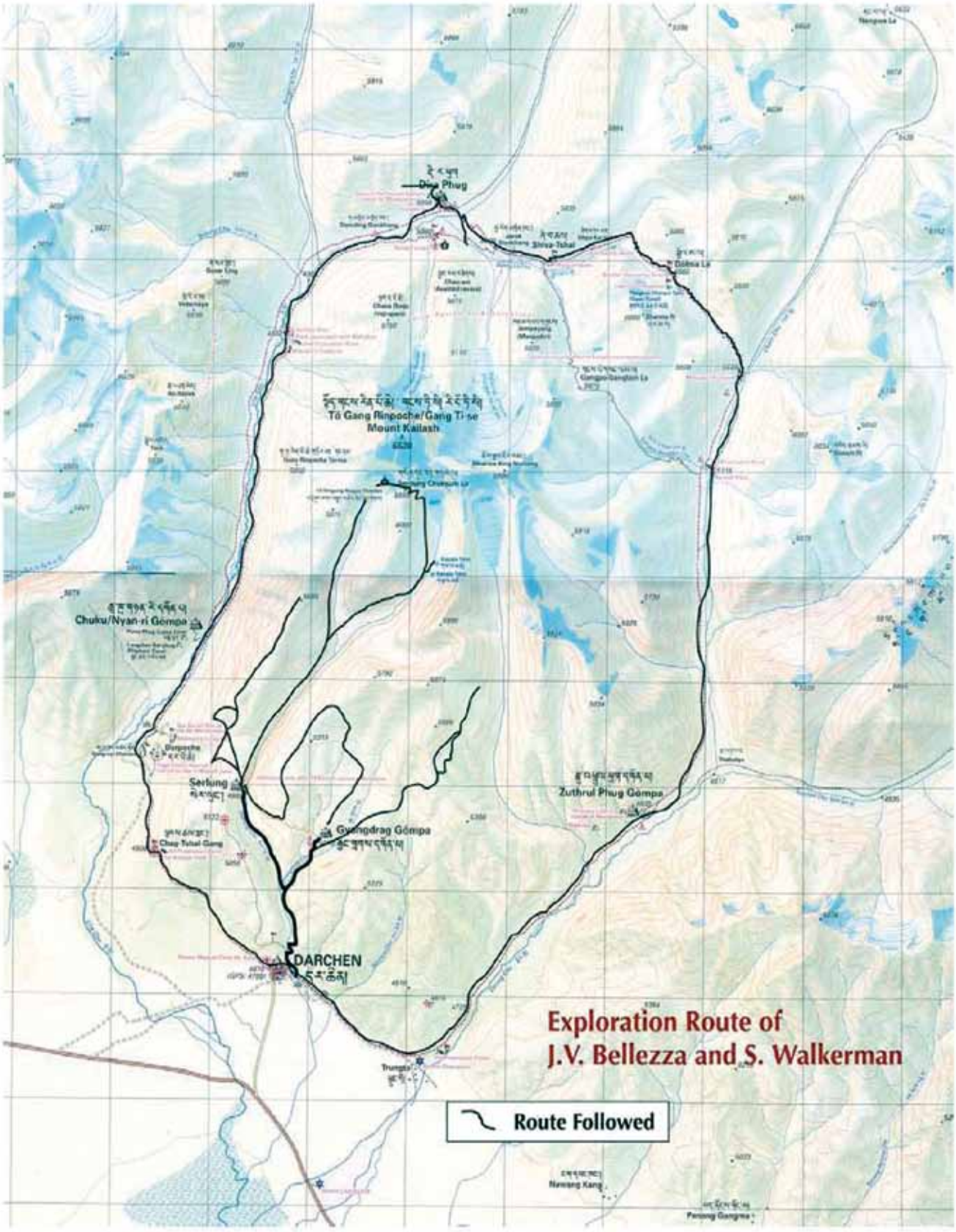
potential age, the remains of Shri Ashtapad, if they exist, should be detectable in the poorly developed soils of Mount Kailash.

As for the foundation of a Jain temple in remote antiquity, 5000 or more years ago, this is highly improbable. Intricately constructed temples, like the ones built by Jains in India in the first millennium CE, were not conceived of in the Neolithic. They are also not characteristic of the Bronze Age and Iron Age archaeological records.

Relying on his vast knowledge of Bon scriptures, Lopon Tenzin Namdak, the foremost Bon scholar of our time, has stated categorically that the Jains did not and could not have built a temple at Mount Kailash in ancient times. Examining the archaeological, cultural and environmental evidence as set out above, I can only reach the same conclusion. As for its possible existence somewhere else in western Tibet, this also seems unlikely. During my comprehensive survey of Zhang Zhung archaeological sites in the greater region (a 12-year project) no such evidence for a Shri Ashtapad temple were discerned.

Given the findings set forth in this report, Shri Ashtapad being Mount Kailash itself seems the most likely prospect. If that is the case, then, Shri Ashtapad is a metaphorical temple, an ageless mass of rock and ice, perfect in every way. As Mount Kailash, Shri Ashtapad is the temple par excellence of the Jains, a grand symbol of their noble dharma, the balm of humanity.

MAPS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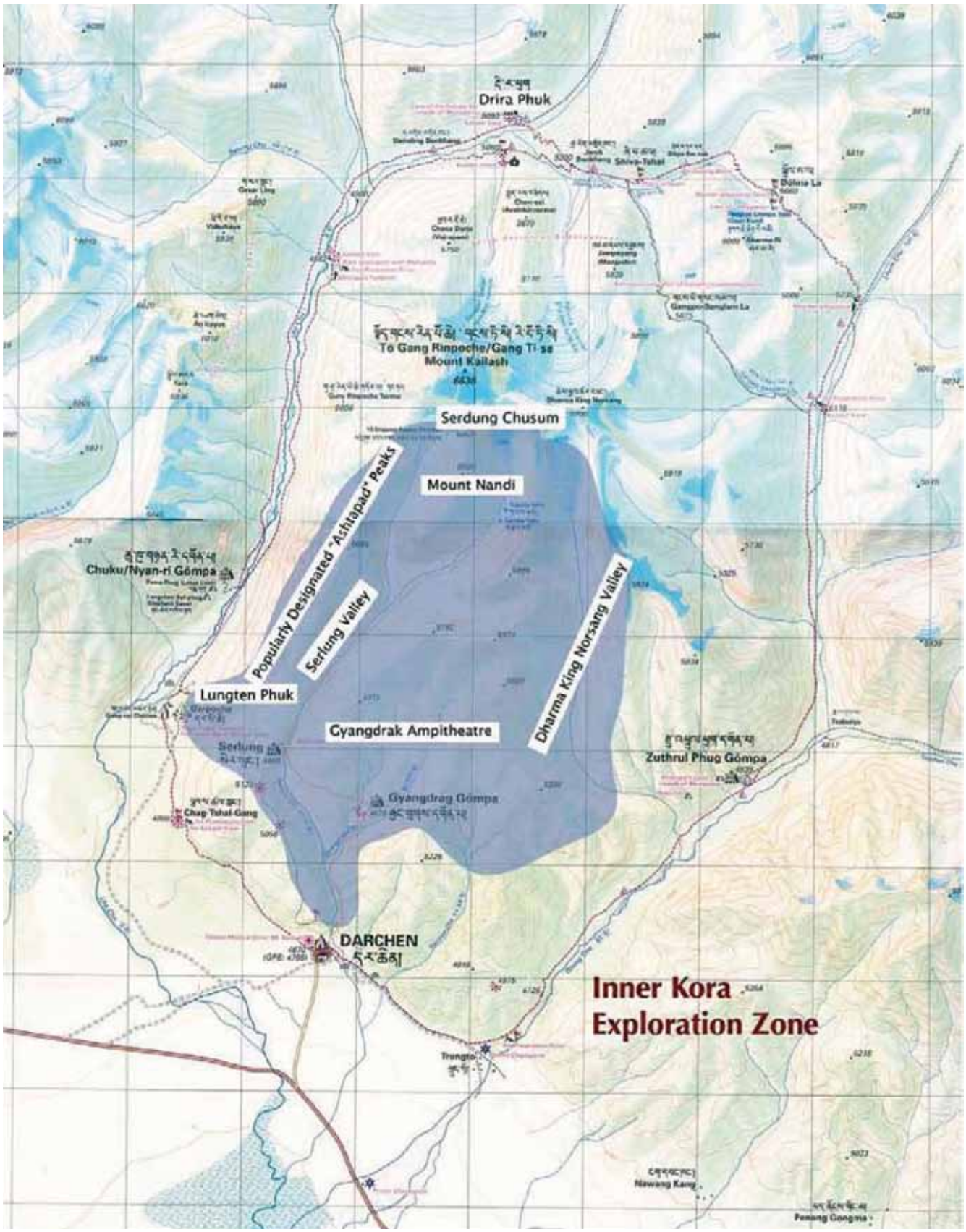
Shiva-Tshal
Dolma La
Gangpo-Dangbon La
Tö Gang Rinpoche/Gang Ti-se
Mount Kailash
Chuku/Nyan-ri Gompa
Serlung
Chag Tshal Gang
Gyangdrag Gompa
Zuthrul Phug Gompa
DARCHEN
Exploration Route of
J.V. Bellezza and S. Walkerman
Route Followed


Drira Phuk
Tö Gang Rinpoche/Gang Ti-se
Mount Kailash
Serdung Chusum
Mount Nandi
Popularly Designated "Ashtapad" Peaks
Serlung Valley
Dharma King Norsang Valley
Chuku/Nyan-ri Gömpa
Lungten Phuk
Cyangdrak Ampitheatre
Serlung
Chag Tshal-Gang
Gyangdrag Gömpa
Zuthrul Phug Gömpa
DARCHEN
Inner Kora
Exploration Zone
Trungto
Nawang Kang
Penang Gongma

8 The Ashtapad Initiative

A. K. Verma

The Kailash Mystique

Kailash has been the most ancient pilgrimage site for reverential worship since the advent of mankind on this planet. No other mountain in the recorded history has drawn humanity from diverse cultural backgrounds and geographies as this mountain, which is geologically also much older than the rest of Himalayas which seperate India and Tibet. The Hindus in India today, a highly evolved race of native Indians which were probably the descendents of aliens from the distant constellation of Sapta Rishi (Ursa Major) which once populated the Indian subcontinent. It is unscientific (based on DNA tests) to accept that the Hindu race and culture were migrants from Central Asia or Europe as western historians would like us to believe (theory of a colonial era) of the invasion of Indian Dravidians by the Aryan race. Aryans and Dravidians (those among the Aryans proficient in Vedas/Tantras) are essentially the native Indians. Even a century earlier this theory was debunked by Swami Vivekananda in several of his lectures across the globe.

Buddhism like Jainism saw Buddha following the footsteps of the Munis of yore for his enlightenment and attained Nirvan. Pre-Buddhist Bons in Tibet, like Hindus, Jains and Buddhists elsewhere held Kailash as the only link between the earth and the transcendental or divine realm of divine and semi-divine beings. For the Hindus it is the seat of Shiva (transcendental or divine consciousness) and Shakti (the power of Shiva) and is the prototypical Meru (Sri Yantra) in the Tantras. For the Jains this represents the Ashtapad and is the connecting link between the divine realm, the earthly realm and the nether worlds. In Tibetan iconography, Demchok and Dorje Phagmo in eternal union are resident on Kailash and is believed to be the mystical Shambhala by the Bons (likewise the Hindus believe it to be Gyanganj or Siddhashrama). For the Buddhists, this represents the Buddha along with all the Bodhisatt was seated in trance.

This convergence of ideas regarding the sanctity of the mountain and its associations also point to their common origin. A circumambulation of this holy mountain is believed to connect the earthly being to the divine realms and is thus a very important ritual from the spiritual point of view as the human ascends in his evolution from temporal to divine status. All seers and mystics of Indian and Tibetan origin from time immemorial are known to have connected to this holy mountain.

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Kundalini Yoga in all its forms and Tantra of both Indian and Tibetan origin have their roots in Mount Kailash and from the revelations in the holy inner sanctum of the cave of Sapta Rishis, who descended into the temporal realm from the divine spheres to redeem the mankind of earthly woes and sow the seeds of divine possibilities in their evolutionary spiritual journey to bliss and eternity. The Jain initiative pioneered by Dr. Rajnikant Shah through the Jain Center of America, New York, of locating Ashtapad is the bold and first ever initiative by any Institution in the world and he will thus be remembered ever in the history of mankind. The expedition's findings subject to my perceptions are briefly outlined in this article.

Ashtapad 2009 expedition findings are as follows:

There are two important issues that relate to the expedition-

1. Ashtapad-where it is believed according to the traditions that Aadinath Rushabhdeva attained his Nirvan.
2. A memorial monument believed to be built by his son in celebration of Aadinathji's attainment.

   From the perspective of the Jain community it is important to locate the memorial monument relics believed to have been made 10,000-12,000 years back by his son which would archaeologically prove the antiquity of the Tirthankars and also serve as an important focus for reverential worship. I would like the two issues to be dealt with separately without linking the first with the second.

1. Ashtapad : I would divest the discussion on this issue of trivialities of our day to day movements during the expedition and details of places enroute to Kailash.

I am happy that John Bellezza completely accepted my idea that Mt. Kailash is Ashtapad and mentioned so in his report. I would like to forward the important reasons why I believe it to be so:

According to the 'Bons'(a pre-Buddhist shamanist sect) Kailash is believed to be a nine storeyed Swastika mountain (well documented beyond any debate). Identically, Hindus believe that it is Mount Meru the central axis around which the various tiers of existence revolve. In the Tantras (a wider version of Hindu shamanism) Meru is likened to a Shri Yantra whose worship is popularized across the country through the Shakta philosophy and Kashmir Shaivism specially popular in the south of India through Sri Vidya or the Devi cult. Those knowledgeable on this subject are aware that Meru the iconographic three dimensional cosmological archetype embodies a nine storeyed pyramidal structure where at the top of the hierarchy (i.e. at the ninth layer) is the Bindu where Shiva-Shakti(divine interplay of consciousness and energy) are resident just as Shiva and Parvati are believed to be resident at Kailash (according to the Shiva Purana/Kailash purana) or the Demchog-Dorje Phagmo by Tibetan Buddhists. To be able to attain this ultimate realization of the undifferentiated experience of consciousness-energy principle at the ninth and final stage of spiritual ascension, it is believed that any Human being would have to transcend the eight steps or Ashtapada to be able to reach Bindu, a point of complete transcendence into the divinity. Sri Vidya texts elaborate this in very great detail the ritual worship of the various layers to attain the penultimate divine state.

In Hindu tantric iconography Meru and Kailash are identical. Some attempts by western authors to show Kailash and Meru as two different mountains citing geographical reasons are not completely unmotivated with a logic rendered frivolous as Kailash existed before the great continents collided.

Similar iconographies in Buddhism, Bon, Hindu and Jain suggest a common origin pointing to the same mountain 'Kailash'. In some Buddhist iconography Kailash is represented as a lotus with eight concentric rows of petals and the mountain peak shown as the central bud in the lotus which is likened to the Mount Kailash surrounded by eight lower ranges of meadows. To my mind these iconographies are important proof of Mount Kailash being Ashtapad as unlike texts which were destroyed in huge quantities succeedingly by various invaders who came to control the Kailash region (Buddhists took over from the Bons and then were subsequently pillaged by the Muslim invaders e.g. Kazakhs from Central Asia before being taken over by Communist regime in toto during the Cultural Revolution). It would not be an extrapolation to say that Bons had similarly taken control of the region from the Jain-Hindu supremacy(After all it is well known in Puranic lore that Vishwakarma was the architect of the region and Kubera ruled once upon a time).

The region having seen generations of invaders must have been divested of any meaningful relic. Iconography unlike oral traditions of texts can last much longer and in some way provides immunity from the pervasive destructive nature of any invasion. The Kailash Mansarovar region owing to its natural setting and beauty has always been rich in imagery and iconography. To depend overwhelmingly on relic objects/archaeological monuments of such antiquity is akin to feigning ignorance of the chaos that this region has been through in its history.

Besides, native adaptations are very common in history, (specially Shiva temples during the Mughal rule in India) which serve to camouflage those that they should serve to preserve. The relic remains of plundered monasteries and temples over centuries have been carted away by unsuspecting natives, unscrupulous traders and as trophies and curios by visitors and invaders alike in the region. My personal opinion on this issue is that it is beyond the pale of archaeologists most of whom whose knowledge of ancient traditions, mysticism and culture is minimal let alone their familiarity with the hoary antiquities of Jainism. There is more than one way of arriving at the truth and that truth is not necessarily revealed from bricks, wood and mortar. Any evidence of this kind can only be of supplementary nature and cannot form the core of historical evidence. Reliance on iconography, oral traditions and sequencing of events based on native texts is a surer way of learning historical facts.

I do not know of anyone more informed about Kailash Mansarovar in recent history than Swami Pranavananda who had spent considerable time researching in the region and spending sometimes over a year continuously in the monasteries around Kailash-Manasarovar. Much of the credit of the Kailash-Manas yatra organized by the Government of India, goes to Swami Pranavananda whose intimate knowledge of the routes, geology, culture and history of the region helped the government in planning out the Yatra. His interest both in Srividya and Mount Kailash was not coincidental and I would concur and tend to attach high significance to his belief that Mount Kailash is Ashtapad.

Kailash peeping behind Ashtapad

Kailash and Ashtapad

2. An important aspect of Ashtapad is the Nirvana of Shri Aadinathji. Without citing sources available abundantly, e.g. Ippolito Desideri (a Jesuit missionary) one of the earliest of European explorers to visit the region mentions in his writings that Padmasambhava who is credited for bringing Buddhism to Tibet from India spent years in meditation and penance in a cave in Mount Kailash. Similarly, the likes of Milarepa, Dattatreya, Guru Nanak and other mystics retreated to the holy cave for their spiritual high. This cave now immortalized as Serdung Chuksum said to be housing monuments of Dregung Kagyupa abbots (this was under the control of Kagyupa) was also known as Sapta Rishi Cave. There were 19 mortal relics now reduced to 13.There is no doubt in my mind that before the control of this holy cave passed into the hands of the Kagyupa sect this should have contained the mortal relics of Bodhisattwas/Munis/Rishis in its hoary antiquity (erasing any visible sign of earlier relic).

A tablet inside the Serdung Chuksum (Sapta Rishi Cave)

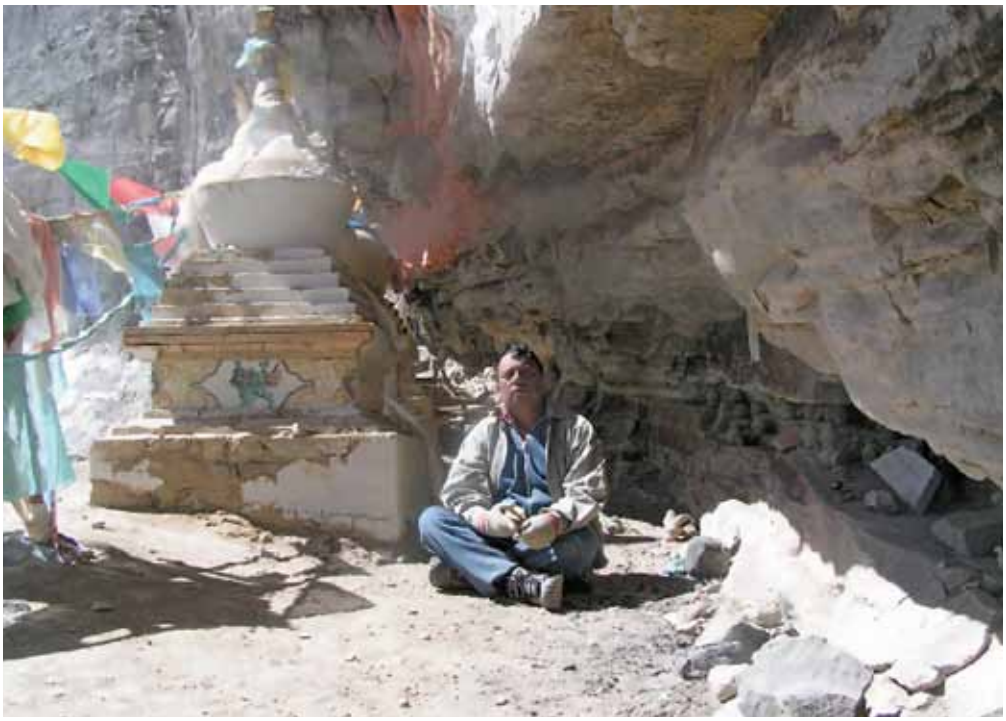
These monuments are currently maintained by Serlung and Gyangdrag monasteries. Clearly the

control has passed several hands and is apparently improvised versions of earlier monuments the history of which is lost much to antiquity although thank as in the region do mention the holy cave.

Nirvan, being a culmination of an elaborate spiritual affair of Self actualization would at the minimum need a quiet and a stable sheltered environment away from the prying eyes of the public and pilgrims. The sacredness of the place of retreat has a powerful emotional appeal to say the least on the subject and in turn is rendered sacred by the lofty spiritual attainment of the subject. No place in the surrounds of the Kailash Mansarovar region can impact as much as the cave in Mount Kailash itself and it is no wonder that mystics of various cultural origins retreated to the holy cave. Shri Aadinathji could not have been an exception and Ashtapad identified as Mount Kailash itself, the Serdung Chuksum (Saptarishi cave) is where Shri Aadinathji would have attained Nirvana and thus rendering it as the holiest of all Jain pilgrim sites. It is easy to dismiss a statement citing lack of evidence but I think logic based on common sense makes for a very strong case and I would say that it may be illogical to abandon this hypothesis unless there is evidence to the contrary.

The holy cave of Serdung Chuksum (Sapta Rishi Cave)

I have visited the Serdung Chuksum twice (June 2006 with Swami Bikash Giri of 'Sumeru Parvat' fame and June 2009) and although I have met pilgrims (albeit few) who have been around Nandi by crossing the Phur-dod-la bypassing the cave altogether(of course one can get a long shot view of the cave just before one is atop the pass) owing to its almost perpendicular and treacherous ascent, I am not sure if any of them could ever visit the cave (the details of the cave can be seen in the pictures already sent by me). I believe a first hand experience of the cave is a must for forming any opinion on the most probable site of Nirvana of Shri Aadinathji. I strongly recommend a visit to the cave to anyone seriously interested. I can conclude based on my convictions that the cave is indeed the site of Shri Aadinathji's Nirvan.



Inside the Serdung Chuksum (Sapta Rishi Cave)

3. There is no other location around the Nandi (I have been around the mountain twice) that shares a similar appeal. Possible sites around the commonly visited Ashtapad to the right of the south face of Kailash had no monumental traces and with no visible shelter at the top overlooking Kailash left us with little possibility of either a Nirvana site there or a memorial monument.

View of Phurdodla from Serdung Chuksum (Sapta Rishi Cave)

Nandi

Exploration of meadows and high hills around Gyangdrag monastery for a possible peek into the surrounds of DKN (Dharma King Norsang)also yielded no results. I also felt that the name DKN aptly described Yudhisthira of Mahabharatha fame (Dharmaraja-a lion among men) and not Shri Aadinathji as perceived. A direct view from Gyangdrag side was rendered impossible owing to the tiers of ranges blocking the view of DKN. A feasible solution to this was to view

Khamdo Sanglam La (2006)

it from Khamdo-Sanglam-la (I have been there earlier, I enclose a couple of pictures from my earlier trip). As is evident also from the contour maps Khamdo-Sanglam-la and Phur Dod-la are probably the closest from where one can get to see DKN. The ascent to Khamdo Sanglamla is through a high pass which is covered by snow all the year round and because of crevasses, snow storms and avalanches is rarely attempted by pilgrims and Tibetan/Chinese guides but I know of no other location which would be practically closest to DKN. My repeated requests to take the Khamdo-Sanglam-la route during the Kora instead of the Dolma-la were hastily turned down citing high risks and heavy snowfall in the region and thus we lost a chance to conclusively say anything about DKN, although Dr. Prabhu Thakker was very keen to have as close a look as possible at DKN for possible monumental relics.

View of DKN ranges from Khamdo Sanglam La (2006)

I would like to conclude by saying the following:

1. Ashtapad is Mount Kailash.
2. Serdung Chuksum (Sapta Rishi cave) is the most probable site of Nirvana of Shri Aadinathji.
3. A memorial monument could not be traced (not implying that it did not exist).

Chapter - 03

Satellite Studies and Imagery

• Various views of probable sites - Ashtapad and Nandi	Photo Gallery
• Archaeology and Satellite Imaging	-
• GeoEye-1 & IKONOS Satellite Data	-
• Locating probable unexplored Archaeological sites for Ashtapad near Kailash in Tibet	P.S. Thakker
• High Resolution 3-D Imagery of Kailash region	Shashikant Sharma & P.S. Thakker

Introduction

Present status of Ashtapad temple is invisible and unknown. It is believed that it may be buried somewhere in the Mt. Kailash region. It has been suggested by experts involved in the project that advanced satellite and imagery and remote sensing techniques be used to explore further the nine or ten probable Ashtapad sites defined during the field visits. Images from satellite or space can be used to locate ruins in remote and inaccessible places on the planet.

This chapter discusses the reports where these techniques have been employed to generate 3D images of the area surrounding Kailash and to obtain aerial photographs of the nine/ ten probable sites identified during these field trips. Dr. Thakker located many buried structures in Kailash area which he discusses in his article.

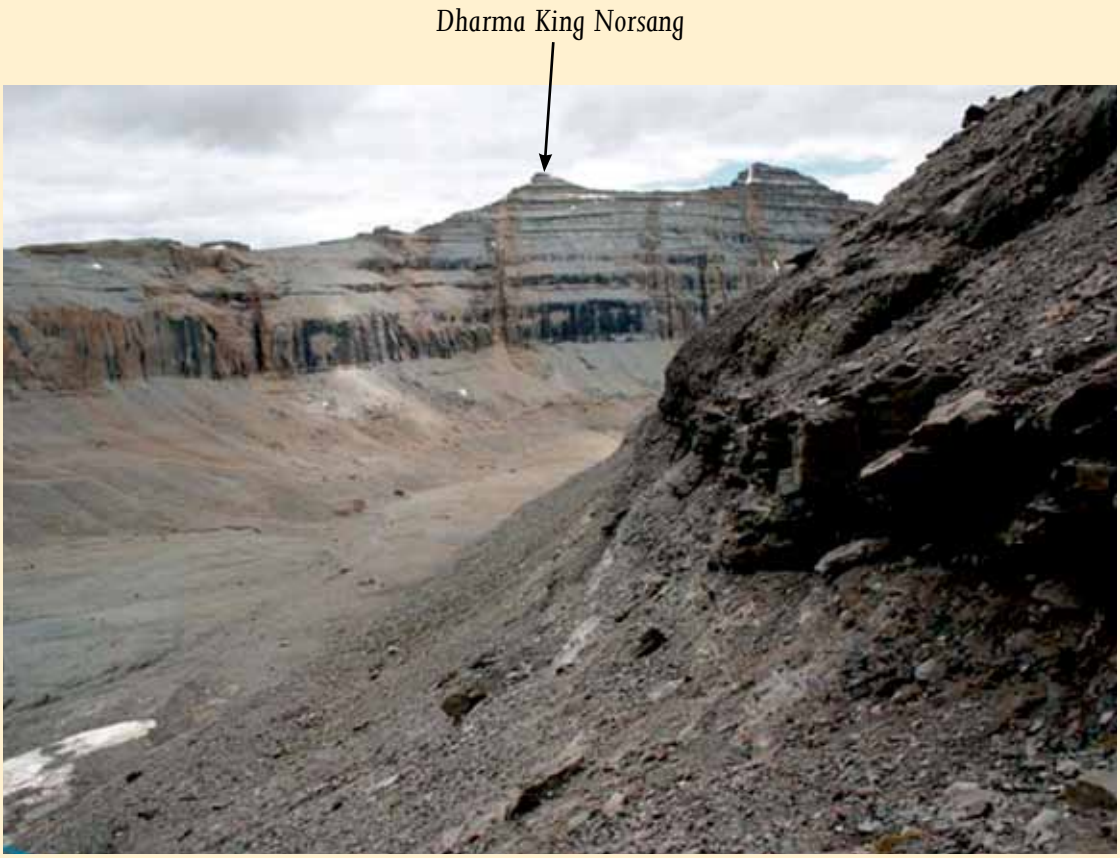
A high resolution 3D video was obtained from Geo-Eye and was evaluated by Shashikant Sharma and Dr. Thakker. A 3D imagery is being presented in his article. We are also providing a 3D video in a DVD format dubbed with information.

Various views of probable sites- Ashtapad and Nandi are given in the Photo Gallery.

Various Views of Probable sites - Ashtapad and Nandi

Lungten Phuk environs, so-called Ashtapad peaks middle and right.
Highest Dokhang at top of center gully on middle peak shoulder

Natural square rock structure, Dharma King Norsang valley



The trench around Dharma King Norsang

Glacial striation in the vicinity of Nandi

View of DKN ranges from Khamdo Sanglam La (2006)

Ashtapad (popularly known) in the foreground

Mount Nandi from the Southwest

North side of Mt. Nandi from Serdung Chuksum La

Nandi - *A distant view*

Crossing the NW-SE trending ledge that connects Kailash peak with that of the Nandi peak

High bowl on west edge of Dharma King Norsang valley

Sun rays on Nandi

Mount Kailash and Mount Nandi from the rim of the Gyangdrag Amphitheatre

9 Archaeology & Satellite Imaging

Archaeologists believe they have unearthed only a small fraction of Egypt's ancient ruins, but they're making new discoveries with help from high-tech allies - satellites that peer into the past from the distance of space.

The enclosure wall of the Great Aten temple in Egypt, as seen from the QuickBird satellite. 1 of 2

"Everyone's becoming more aware of this technology and what it can do," said Sarah Parcak, an archaeologist who heads the Laboratory for Global Health at the University of Alabama at Birmingham. "There is so much to learn."

Images from space have been around for decades. Yet only in the past decade or so has the resolution of images from commercial satellites sharpened enough to be of much use to archaeologists. Today, scientists can use them to locate ruins- some no bigger than a small living room - in some of the most remote and forbidding places on the planet.

Ref. Vol. XVI Ch 128B Pg. 7467-7469

In this field, Parcak is a pioneer. Her work in Egypt has yielded hundreds of finds in regions of the Middle Egypt and the eastern Nile River Delta.

Parcak conducted surveys and expeditions in the eastern Nile Delta and Middle Egypt in 2003 and 2004 that confirmed 132 sites that were initially suggested by satellite images. Eighty-three of those sites had never been visited or recorded.

In the past two years, she has found hundreds more, she said, leading her to amend an earlier conclusion that Egyptologists have found only the tip of the iceberg.

These discoveries are of no small significance to the Egyptian government, which has devoted itself a new to protecting archaeological sites from plunder and encroachment.

The **Supreme Council of Antiquities** has restricted excavation in the most sensitive areas along the Nile - from the Great Pyramids at Giza on the outskirts of Cairo to the carvings of Ramses II in the remote south.

Antiquities officials hope the move will encourage more surveys in the eastern Nile Delta in northern **Egypt.** Parcak said, where encroaching development in the burgeoning nation of 82 million poses the greatest threat to the sites.

Parcak's process weds modern tools with old-fashioned grunt work.

The archaeologist studies satellite images stored on a NASA database and plugs in global positioning coordinates for suspected sites, then tramps out to see them. Telltale signs such as raised elevations and pot shards can confirm the images.

As a result, the big picture comes into view.

"We can see patterns in settlements that correspond to the [historical] texts," Parcak said, "such as if foreign invasions affected the occupation of ancient sites."

"We can see where the Romans built over what the Egyptians had built, and where the Coptic Christians built over what the Romans had built."

"It's an incredible continuity of occupation and reuse."

The flooding and meanders of the Nile over the millennia dictated where and how ancient Egyptians lived, and the profusion of new data

"It's an incredible continuity of occupation and reuse."

The flooding and meanders of the Nile over the millennia dictated where and how ancient Egyptians lived, and the profusion of new data has built a more precise picture of how that worked.

"Surveys give us information about broader ancient settlement patterns, such as patterns of city growth and collapse over time, that excavations do not," said Parcak, author of a forthcoming book titled "Satellite Remote Sensing and Archaeology."

The vagaries of climate in the region make satellite technology advantageous, too.

"Certain plants that may indicate sites grow during certain times of the year," Parcak said, "while

sites may only appear during a wet or dry season. This is different everywhere in the world."

Archaeologists working in much more verdant climates, such as Cambodia and Guatemala, also have used the technology to divine locations of undiscovered ruins.

They have been able to see similarities between the vegetation at known sites and suspected sites that showed up in fine infrared and ultraviolet images covering wide areas of forbidding terrain.

"For the work I do [in Egypt], I need wet season images as wet soil does a better job at detecting sites with the satellite imagery data I use," Parcak said. "I can pick the exact months I need with the NASA satellite datasets."

Benefits of a bird's-eye view

Remote subsurface sensing has been used in archaeology in one form or another for years, though the term "remote" doesn't necessarily imply great distance. Typically, a surveyor has wheeled a sensing device over a marked-out area to determine what lies below.

The sensing devices employ any of an array of technologies, such as Ground Penetrating Radar. They bounce signals off objects below the surface and translate the data into images that a scientist's trained eye can decipher.

Multispectral imaging encompasses technologies that "see" what the human eye can't, such as infrared and ultraviolet radiation. Scientists have used it for years to study the Earth's surface for a variety of purposes. Until resolution of these images improved, though, the only way to produce a sharp image was to be relatively close to the ground.

For those lugging unwieldy gear across jungle and desert, an effective bird's-eye view can change the world. It lets them leave behind the days and days of meticulous "prospecting" and get results from airplane - mounted sensors or, later on, a flyover by an advanced satellite.

One of the most advanced is called Quick Bird, which has been in orbit since 2001 and can provide high-resolution images of 11-mile-wide swaths. The satellite can collect nearly 29 million square miles of imagery data in a year, according to Digital Globe, which developed and operates Quick Bird.

The company, based in Longmont, Colorado, is working on an upgrade. World View-2, to be launched in 2009, will offer sharper resolution of visual and multispectral images than Quick Bird, according to the company's Web site.

In the end, though, a tool is only as useful as its wielder.

"Most of the advances have come through processing on the ground by end users such as Dr. Parcak," said Digital Globe spokesman Chuck Herring.

– 31 Dec. 08

10 GeoEye–1 & IKONOS Satellite Data

GeoEye is a leading source of geospatial information and insight for decision makers and analysts, who need a clear understanding of our changing world to protect lives, manage risk and optimize resources. Widely recognized as a pioneer in high-resolution satellite imagery, GeoEye has evolved into a complete provider of geospatial intelligence solutions.

GeoEye's ability to collect, process and analyze massive amounts of geospatial data allows us to quickly see precise changes on the ground and anticipate where events may occur. They own and operate two color Earth-imaging satellites, GeoEye-1 and IKONOS, and three airplanes with advanced high-resolution imagery collection capabilities. GeoEye-1 is the world's highest resolution and most accurate commercial Earth-imaging satellite.

GeoEye's Imagery Sources collect vast amounts of high-resolution satellite and aerial imagery from around the globe each day. This imagery is processed and used in a multitude of applications such as mapping, disaster response, infrastructure management, and environmental monitoring.

Presented in this article is the Satellite Imagery of the Kailash Mansarovar Area – several images have been recorded since 2008 under direction of the Ashtapad Research International Foundation and guidance of team members – Dr. P.S. Thakker, Dr. Navin Juyal and Mr. Shashikant Sharma. Many attempts of image collection have resulted in cloud covered or snow covered images of the Kailash Mansarovar region. We did have some cloud free imagery. This data is useful for studying the probable sites of Ashtapad, Mt. Nandi region, sites of Gyangdrag Gompa and Dharma King Norsang (DKN) and the surrounding area.

Satellite information

GeoEye-1

GeoEye again made history with the Sept. 6, 2008 launch of GeoEye-1 - the world's highest resolution commercial earth-imaging satellite.

GeoEye-1 is equipped with the most sophisticated technology ever used in a commercial satellite system. It offers unprecedented spatial resolution by simultaneously acquiring 0.41-meter panchromatic and 1.65-meter multispectral imagery.

IKONOS

GeoEye first made history with the IKONOS satellite launch on Sept. 24, 1999. IKONOS, derived from the Greek word for image, is the world's first commercial satellite able to collect black-and-white (panchromatic) images with 82-centimeter resolution and multispectral imagery with 4-meter resolution.

Ref. Vol. XIX Ch 146 Pg. 8411-8431

Imagery from both sensors can be merged to create 1-meter color imagery (pan-sharpened). The more than 300 million square kilometers of imagery that IKONOS has collected over every continent is being used for national security, military mapping, air and marine transportation, and by regional and local governments.

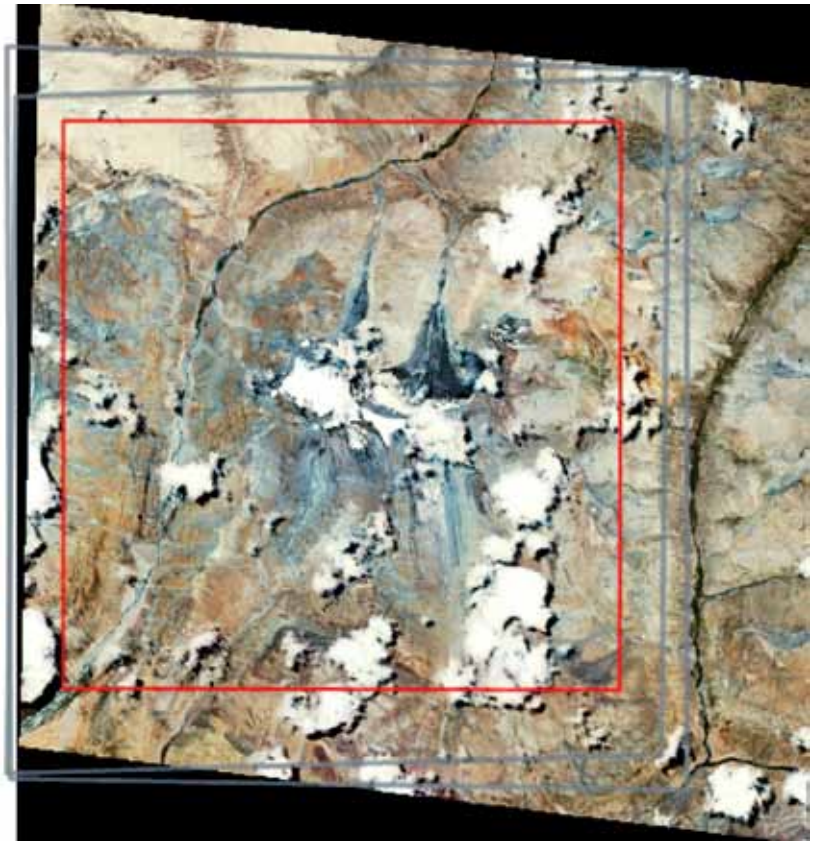
The band width/ frequency used for the images below are as under:

Spatial Resolution	0.82 meter GSD at Nadir	3.2 meter GSD at Nadir
Spectral Range	450-900 nm	450-520 nm (blue) 520-600 nm (green) 625-695 nm (red) 760-900 nm (near IR)

We have used 1 m pan Sharpened images in which pan 0.82 m resolution data is merged blue green red and NIR 3.2 m resolution data. Thus wave length frequency is 450-900 nm.

All the images collected for the research study undertaken are available through the following link :

http://geofuse.geoeye.com/Maps/Map.aspx?pv=2&geometryType=polygon&geometryWKT=POLYGON+((81.2599+31.0217%2c81.2602+31.1119%2c81.3651+31.1117%2c81.3647+31.0214%2c81.2599+31.0217%2c81.2599+31.0217))&mapCenterWKT=POINT+(81.3125+31.0667)&zoomLevel=10&whereClause=100,IKONOS-2,07/20/2009,08/11/2010



Satellite Imagery of Kailash Region

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Best of Ranking	7502
Cloud Cover Percentage	15
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Collection Month	8
Collection Year	2009
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Downlink Location	OOC
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Ground Sample Distance	1.00590002
Image Identifier	2009080205125090000011607655200004565390OTHC
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Imagery Source	IKONOS-2
Imagery Source Abbreviation	IK-2 Abbreviation
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LAYER_FILE_URL	
LL_LAT	31.0125
LL_LON	81.2515
LR_LAT	30.9965
LR_LOH	81.4011
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Scene Identifier	2000045653900THC
Sensor Azimuth Angle	121.2884
Sensor Elevation Angle	60.8799
Sensor Mode	KPMS
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Shape - Length	**0.535965397068633**
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SQKM	**187.0094**
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UR_LON	**81.4014**
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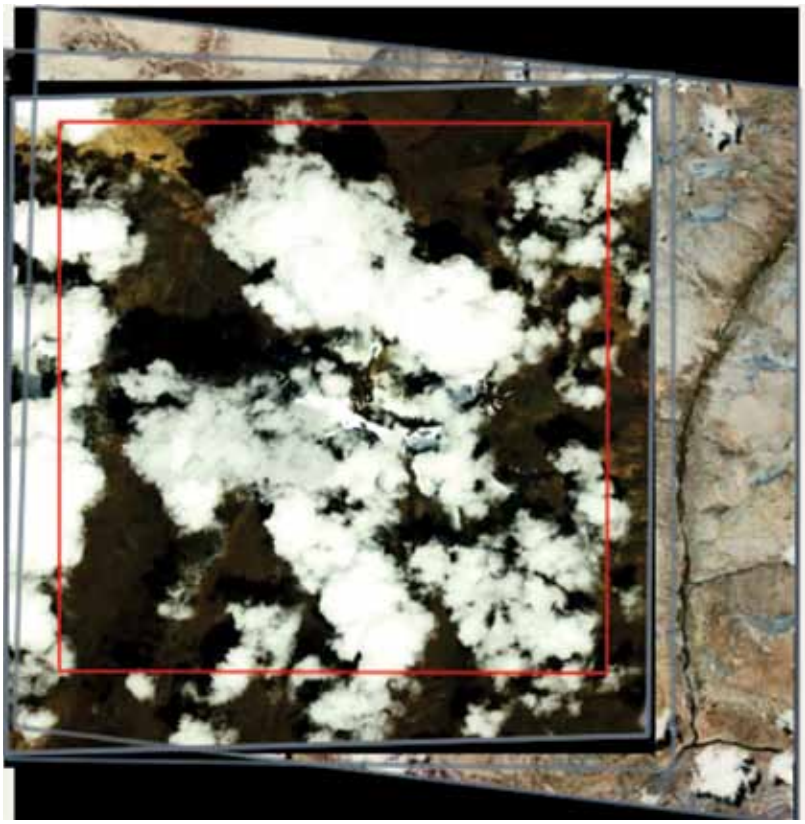


Cloud covered satellite image of the Kailash Region

Project : 154367

Satellite Image of Mt. Kailash and surrounding area

Satellite Image of Mt. Kailash and surrounding area
The probable site of Ashtapad shrine with help of satellite image

11 Locating probable unexplored Archaeological sites for Ashtapad near Kailash in Tibet

P.S. Thakker

Jain Center of America, New York (JCA) has been gifted with a model of Shri Ashtapad Maha Tirth. The center is working on a project to locate it in the present times. Three field trips were organized to find out the existence of Ashtapad near Kailash in central Himalayas during 2006, 2007 and 2009. For this purpose a team consisting of scientists, scholars, translators, climbers and a professional photographer were sent with a person who had visited Kailash few times earlier. I had the privilege of exploring Kailash Mansarovar area. during all three field trips.

According to Jain belief, Lord Rushabhdev was the first Tirthankar of present age (Avsarpini) hence the name Aadinath. He was an *Arhat* - a liberated soul. As per Jain scripture he was a King and he taught *Asi, Masi and Krishi* to the society. Bhagwan Rushabhdev had attained *Nirvana* at Ashtapad near Mt. Kailash in Tibet. In his memory, his son King Bharat constructed a temple at the place of *Nirvana* on Ashtapad Mountain.

Present status of Ashtapad Maha Tirth is invisible and unknown. The type of this temple was *Sarvatobhadra, Chaturmukhi*. Nobody has seen the temple in this shape. Only literary evidences are available from the scripture. At present the location of Ashtapad Mountain is also debatable. One school of thought is that the Kailash itself is the Ashtapad whereas other school of thought is that Kailash and Ashtapad mountains are different mountains and not the same, but the exact location of Ashtapad is unknown.

Researchers and pilgrims visit Kailash Mansarovar region in a hope to know something more and get some new information about Ashtapad. It is believed that it is buried somewhere in this region.It has not yet been located precisely and few attempts have been made to locate the same.

It is believed that there are 9 possible sites as per the information gathered from various sources. Probable locations are:

1) Kailash 2) Bonari 3) Barkha Plains 4) Ashtapad near Tarboche 5) Nandi Parvat 6) Ashtapad Mountain between Gyangdrag monastery and Serlung Gompa 7) Gyangdrag or Gangta monastery and hillock to the north of it 8) 13 Drigung at the base of Kailash 9) Trinetra or Gombo Phang

The measurement of Ashtapad temple is one *yojan* in length, two *kosh* in width and three *kosh* in height. (Vol. II pg.526) whereas according to Munishree Panyas Nandi Ghosh Vijayji Maharaj the temple or *chaitya* is two *gau* in width and four *gau* in length, and the height is three *gau*. This

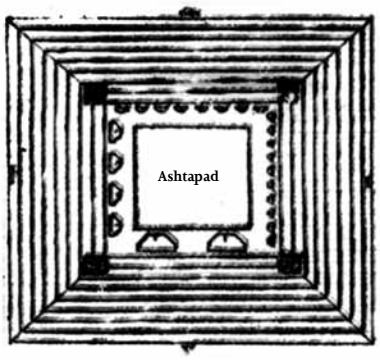
Ref. Vol. XX Ch. 151 A Pg. 8561-8639

measurement is given as per the scripture at the beginning of the fourth *Era*. Thus the width may be 200 feet and length may be 400 feet. But according to the discussions with him, the shape of the site is square in shape. The square shape, can it be a Swastika shape also?

Members of the second field trip

Team members of Ashtapad research group dissussing with Mrs. Flaviu, a Swiss lady

Ashtapad design as per scripture



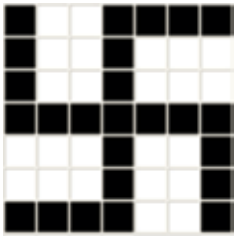
Panch Tatvas - 5 Elements

Prithvi (Earth), Jal (Water), Vayu (Air), Agni (Fire), Akash (Space)

Sun, Moon and Pashupatinath (Lord of Animals – Lord Shiva), Yajman

Ashtapad means five main elements – Prithvi (Earth), Jal (Water), Vayu (Air), Agni (Fire), Akash (Space) and Three yajamans – Sun, Moon and Pashupatinath (Lord of Animals – Lord Shiva).

Swastika



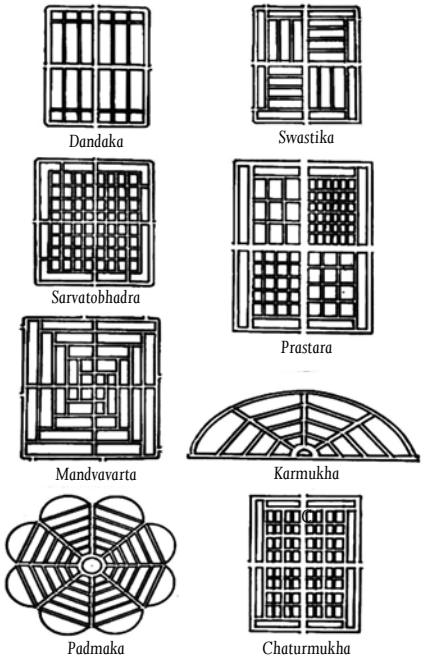
The earliest archaeological evidence of a Swastika motif dates from the Upper Paleolithic period (ca. 10,000 B.C E).The Swastika symbol has been used for thousands of years already in almost all human civilizations as a sign for good luck and protection.

The Swastika has been a religious emblem of worldwide occurrence since at least 10,000 B.C. It appeared on the oldest coinage in India, on images of Buddha in Japan and on Greek and Roman figures of the Great Goddess. On artifacts dating from the thirteenth century B.C. onward, the Swastika has been found in Asia Minor, Greece, China, Persia, Lybia, Scandinavia, Britain and Iceland. In popular notions, it is the Jain cross.

Swastika is means having eight '*pad*' or legs. If the site was having swastika shape then this shape may be important in reference to Ashtapad Maha Tirth.

Author has worked in the field of space archaeology and detected many unexplored archaeological sites on satellite data which were located on maps and confirmed on ground in Indian states and adjoining countries. Our ancient cities were having certain shapes and the cities were known as per the layout and the shapes of the cities like Dandaka, Prastara, Chaturmukha, Nandyavarta, Karmuka, Padmaka, Sarvatobhadra etc., as shown under.

Various layouts of the cities



The City of Patliputra

1 *Palace*
2 *Garden*
3 *Water and Fish Tank*
4 *Bazaar and Street*
5 *Houses of Citizen*
6 *Wooden Wall*
7 *Water Ditch*
8 *Main Gate of the city*

Satellite picture also shows various shapes of ancient cities like square, rectangular, triangular, semi lunar, circular etc. City like Lumbini, the birth place of Lord Buddha located in Nepal was having a rectangular shape. Ahichhatra in Uttar Pradesh India was having a triangular shape, Kalinga or Shisupalgadh was of square shape, Nalanda was having square/rectangular/or plus

mark or 'chopat'shape, Pataliputra or Gaya in Bihar was having a circular shape. This can be seen from the figures shown below.

Satellite images of ancient cities

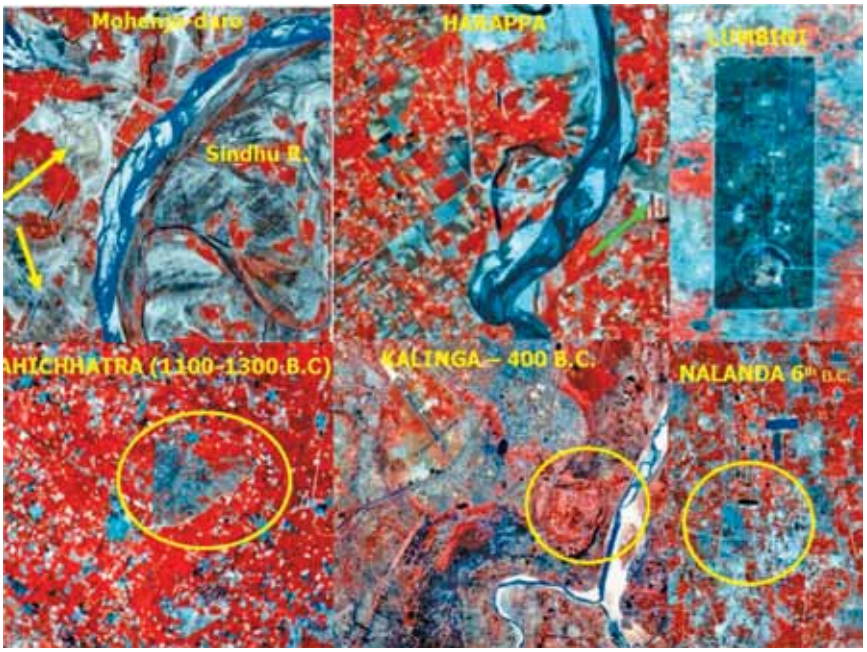


Figure shows ancient cities like Lumbini, Ahichhatra, Sishupalgadh-Kalinga & Nalanda

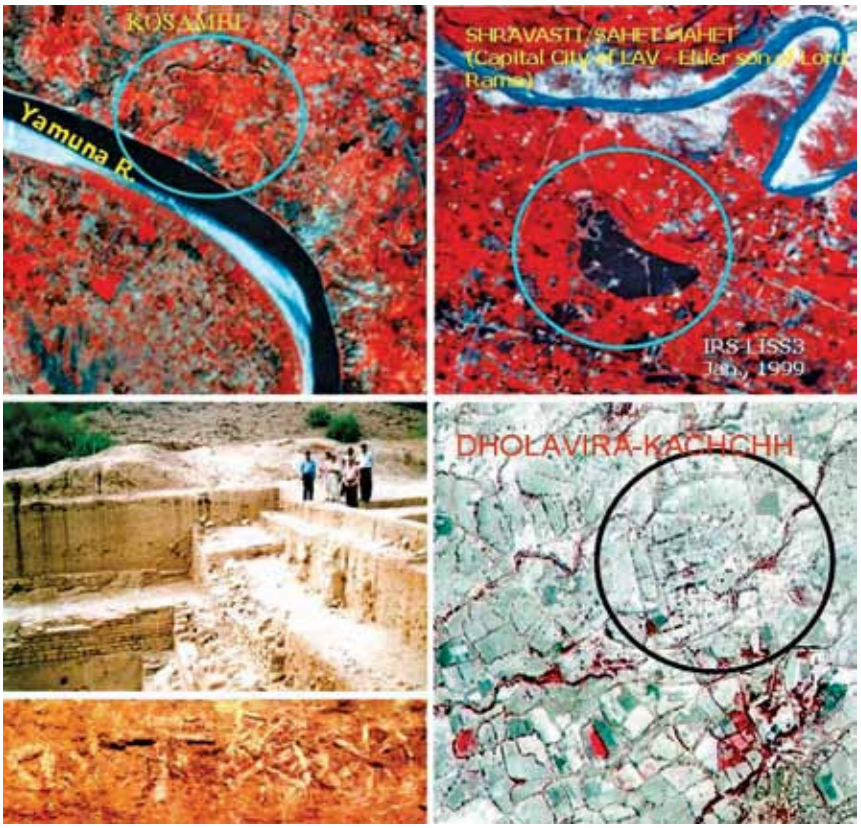


Figure shows semi lunar shape Lumbini, square shape Dholavira, Gujarat & Kosambi in UP.

Thus satellite data proves that our ancient cities were that of certain shapes which were known by different names accordingly. Even today such temples are there in existence and some new temples having such plans are under construction. The figure shows existence of such Chaturmukha temple at Dhulingmath in Tibet and Mahavirpuram temple at Gandhinagar, Gujarat, India under construction.

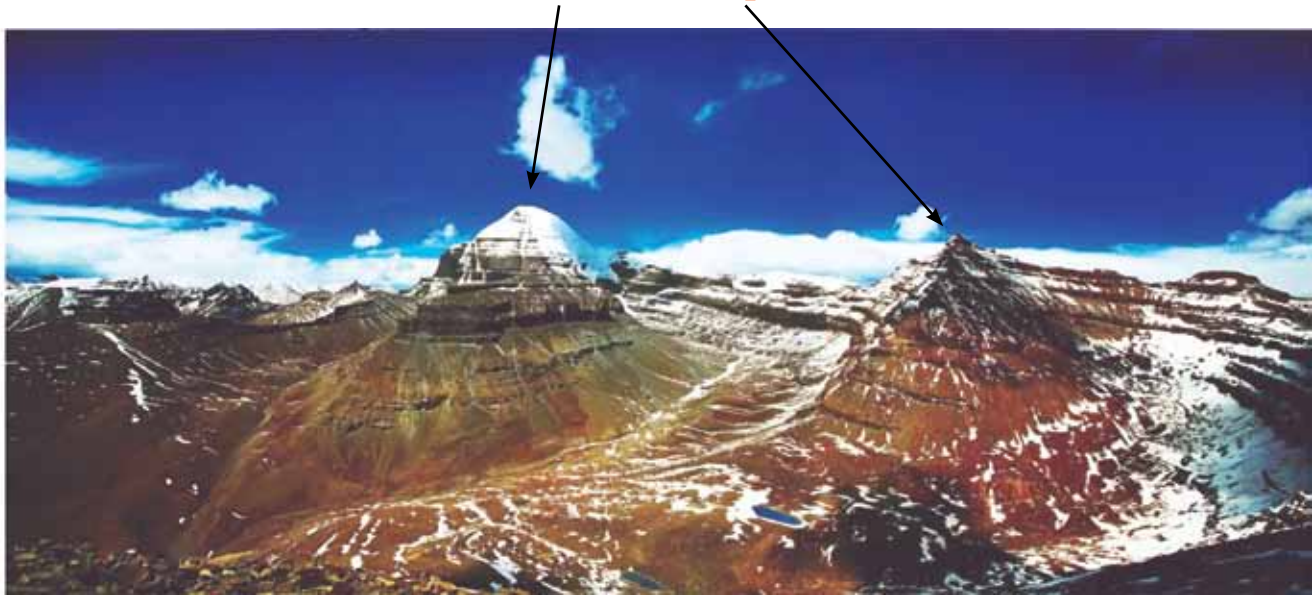
Chaturmukha

Mandala Temple (old) at Dhulingmath, Tibet

Gandhinagar - Mahavirpuram (new) in Gujarat, India (under & after construction)

The following picture shows the location of Mt. Kailash and Ashtapad in commercially available aerial photograph.

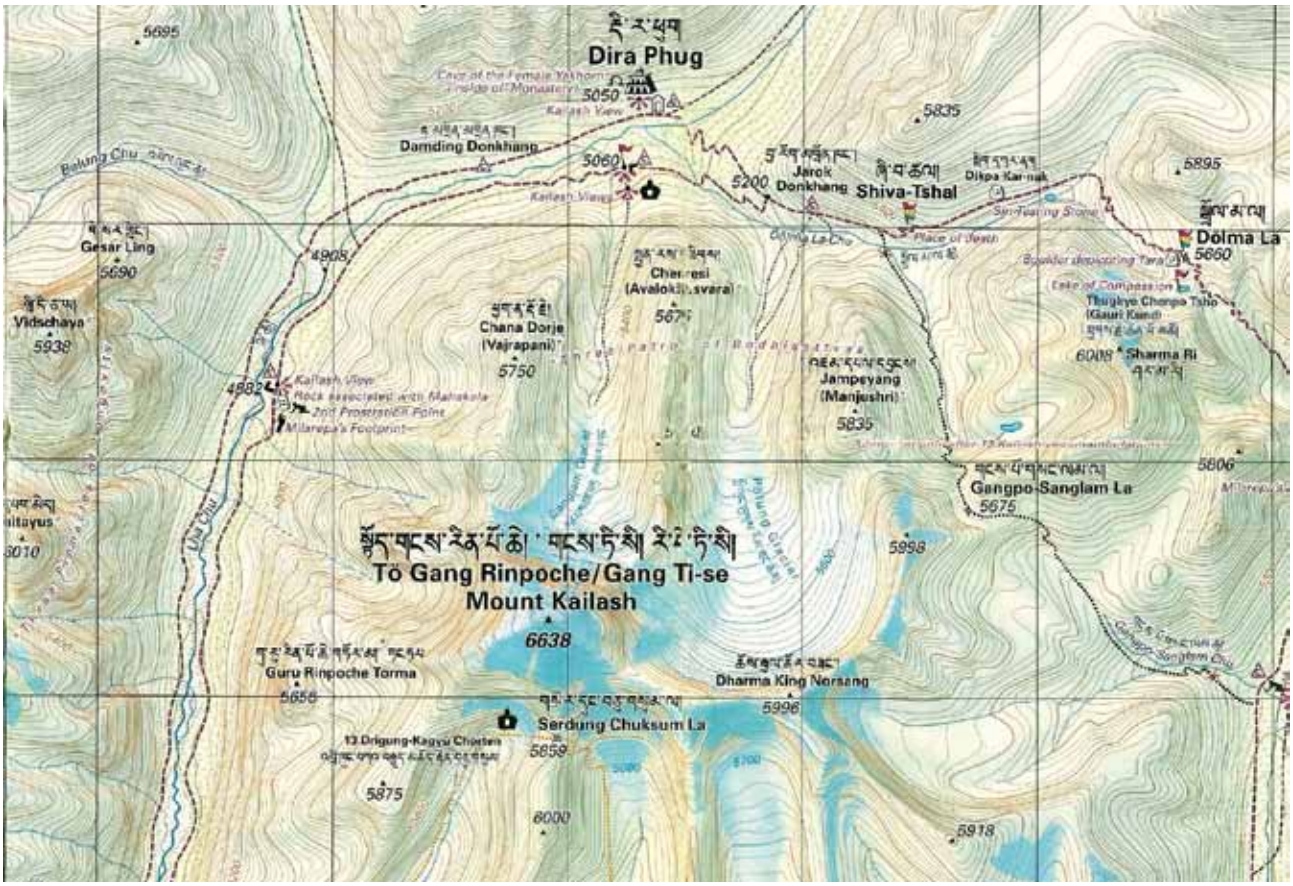
Kailash - Ashtapad



Kailash and Ashtapad on aerial photograph

This was compared with the 1:50,000 scale trekking map of Kailash purchased from Kathmandu, published by Karto Atelier, Nepal. After analyzing data I believe that I am near success in locating Ashtapad from the IRS LISS-IV data.

Topography of Kailash Area



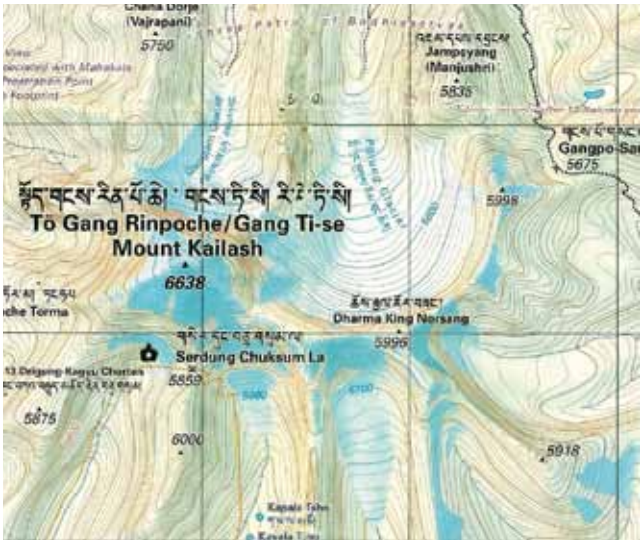
Location of Mount Kailash, 13 Drigung Kagyu and Dharma King Norsang

The probable site of Ashtapad is located to the south east of Mt. Kailash (6638m), at the altitude of Ashtapad that is 5996 m. Mt Kailash is known as Gang Rinpoche/ Gang Ti-se. It is 5km SE of DiraPhuk: 5 km SW of Dolma La. 7.5 km NW of Zutul Phuk: 8km NE of Gyangdrag Monastery: 8.5 km NE of Ser Lung Gompa.9 km N/E of Darphoche/ Yam Dwar, or Moksha Dwar. It is 2.5 km to the east of 13 Drigung- Kagyu chorten: 2 km to the east of Serdung Chuksum La, or 2.5km SW of Sangpo- Sanglam La. The site is easily approachable from Serdung Chuksum La or Gangpo Sanglam La.

When I saw a picture poster with my colleague, Shashikant Sharma, which was commercially available and was bought by him in Tibet. I assumed that the photograph was taken from the south side of Kailash and flight path of the helicopter must be from SW to NE i.e. from Darchen side to east of Kailash. I tried to locate the other peak with reference to Kailash with the help of my colleague Shashikant Sharma and located the same i.e. Dharma King Norsang (DKN) as Ashtapad peak.

The description given by Swami Anand Bhairav Giri (Ashtapad Model vol. 7 pp3046: Tithyar year 29, issue 1 pp 69), does not match with any of the other nine sites found in literature but it perfectly matches with this newly discovered site of probable location of Ashtapad i.e. Dharma King Norsang by satellite imagery.

Ashtapad - Dharma King Norsang



Square structures, on satellite image indicating human activity at the site.
The map shows the location of Dharma King Norsang., probably three Chovisi i.e. 72 Jinalaya.

Kailash and DKN Glacier

Figure shows glacier between Kailash and Dharma King Norsang

Probable site on ground

Figure shows probable site of Ashtapad to the SW of Dharma King Norsang

The probable Ashtapad site yet to be confirmed on ground

The site located by me with the help of aerial photograph, (commercially available in poster form at Kathmandu), trekking map and satellite data is known as Dharma King Norsang. The name also indicates the place of Shiva or Aadinath or Rushabhdev's place of death. It indicates

Dharma King means King of religion and Norsang means like a lion in human beings. Thus place name also indicates the place of Ashtapad that of Aadinath or Rushabhdev or Shiva. There is a trench surrounding the Ashtapad which was made by the descendants of Aadinath.

Probable site of Ashtapad

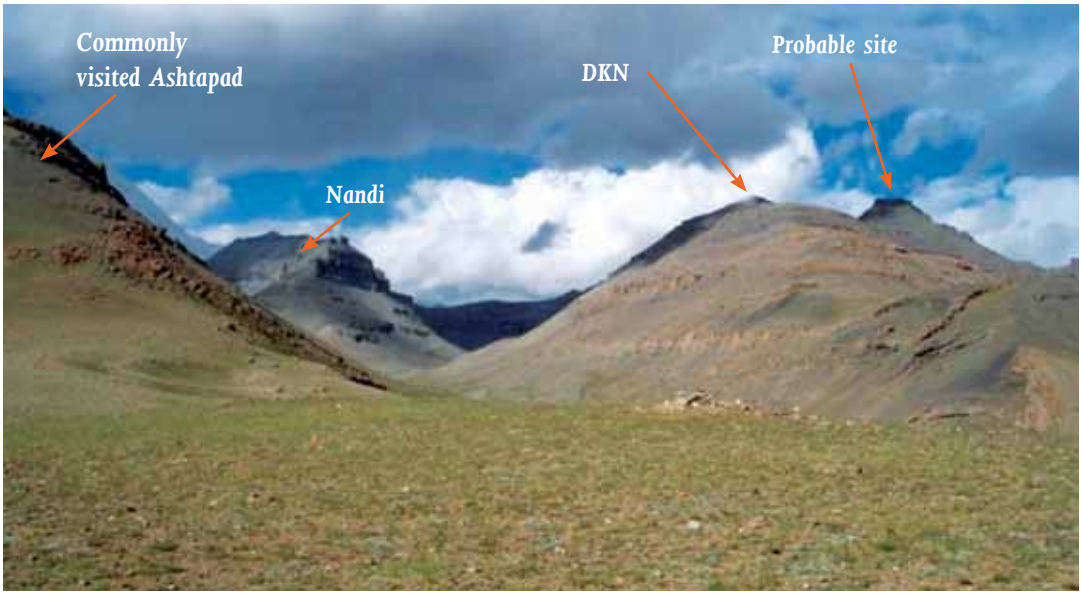


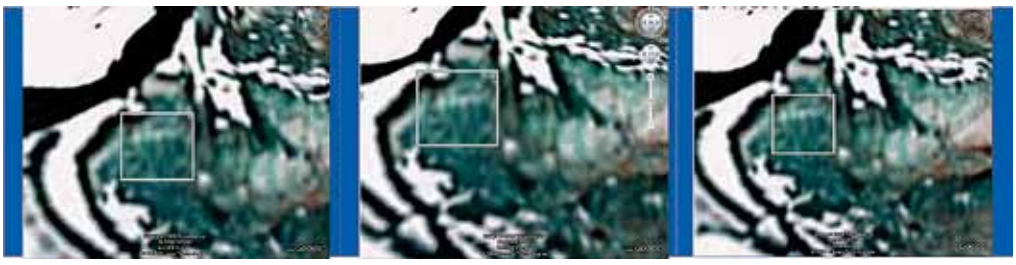
Figure shows Nandi, Commonly visited Ashtapad Site, Dharma King Norsang and probable site of Ashtapad yet to be confirmed on ground

The site located using satellite data, the Dharma King Norsang seems most appropriate for the site of Ashtapad Mountain and Ashtapad Maha Tirth.

The place is yet to be confirmed on ground. Detail study is to be carried out using GIS (Geographic information system) and other satellite data. Comparison of the measurement of the temple found in the satellite image and measurement found in literature or given by Jain Munis will be carried out in future during DEM (Digital elevation model) generation & GIS analysis.

Finally in conclusion I can say that even though we could not locate any archaeological evidences or could not reach Dharma King Norsang site in these trips: Dharma King Norsang site needs to be explored further on satellite data as it might probably be the site of Ashtapad Maha Tirth. The site shows Swastika like structure in satellite data.

Swastika shape imagery seen at Dharma King Norsang



Swastika shape seen could be the probable site of Dharma King Norsang

IKONOS data was ordered, to study the probable unexplored archaeological site of Ashtapad detected from LISS IV data. Three dimensional pictures were prepared using 2009 covering 10 km X 10 km area around Ashtapad was obtained and it was wrapped on digital elevation data of that region. Hence it was possible to visualize the complete terrain of Ashtapad and nearby areas in a 3D environment. The high resolution satellite data provided the minute details of land features in the area and elevation data provided the real effect of mountain and valleys in the region. Using this technology, one can navigate through any region in the valley or on the top of mountain, on click of mouse. It gave a real environment of fly-through and walk-through in this inaccessible region. The complete '*parikrama*' route of Kailash can be visualized in a 3D environment. All the peaks were clearly visible and accessible through the movement of the mouse. It was very easy to find whether there is any man made structure on any inaccessible areas of that region. It was virtually possible to reach any place in this vast and difficult terrain.

Probable Ashtapad site – Nandi Hill

However we could not confirm the site on ground during the visits of 2007 and 2009 as the area was covered by the snow, which was difficult to reach and inaccessible. The IKONOS data also indicates some other structures which might have existed in this region. I met a local Buddhist saint at Darchen with the help of my guide. I was accompanied by Mrs. Flaviu. He informed us that there were some structures earlier there, but to reach the region is very difficult. I tried to reach the site during my 2007 visit but as I was alone and my guide was reluctant to stay and he was not ready to go further, I could not climb the hillock. I had no other option but to return from the site to reach Darchen by night.

The other sites might have been thought of during different periods. Future research work should be carried out at Dharma King Norsang site which is the potential site of Ashtapad Mountain and Ashtapad temple.

Dharma King Norsang (DKN) is a part of Mount Kailash region. It remains covered with snow, hence name Dhavalgiri. Kailash itself is matching with this probable site and supports the belief that Kailash also known as Dhavalgiri in literature is probably Ashtapad. **Thus there is no stand for the other nine claimants of Ashtapad anymore as Ashtapad Mountain or Ashtapad Maha Tirth. The Ashtapad Maha Tirth might be that of Swastika shape.**

Note:

Different Eras

Shrishti Samvat : 1, 97, 29, 49, 110
Christian Era : 2011
Shak Samvat : 1933
Vikram Samvat : 2968
Israel Era : 5752
Kali Samvat : 5300 Approx

12 High Resolution 3-D Imagery of Kailash Region

Shashikant Sharma and P.S. Thakker

Ashtapad area is located near Kailash in a very inaccessible terrain. It is not possible to reach on the top of every peak. It was decided to use very high resolution satellite data and elevation data to visualize the 3D terrain of this region. Very high resolution (1 meter) satellite data of 2009 covering 10 km X 10 km area around Ashtapad was obtained and it was wrapped on digital elevation data of that region. Hence it was possible to visualize the complete terrain of Ashtapad and nearby areas in a 3D environment. The high resolution satellite data provided the minute details of land features in the area and elevation data provided the real effect of mountain and valleys in the region. Using this technology, one can navigate through any region in the valley or on the top of mountain, on click of mouse. It gave a real environment of fly-through and walk-through in this inaccessible region. The complete 'parikrama' route of Kailash can be visualized in a 3D environment. All the peaks were clearly visible and accessible through the movement of mouse. It was very easy to find whether there is any man made structure on any inaccessible areas of that region. It was virtually possible to reach any place in this vast and difficult terrain.

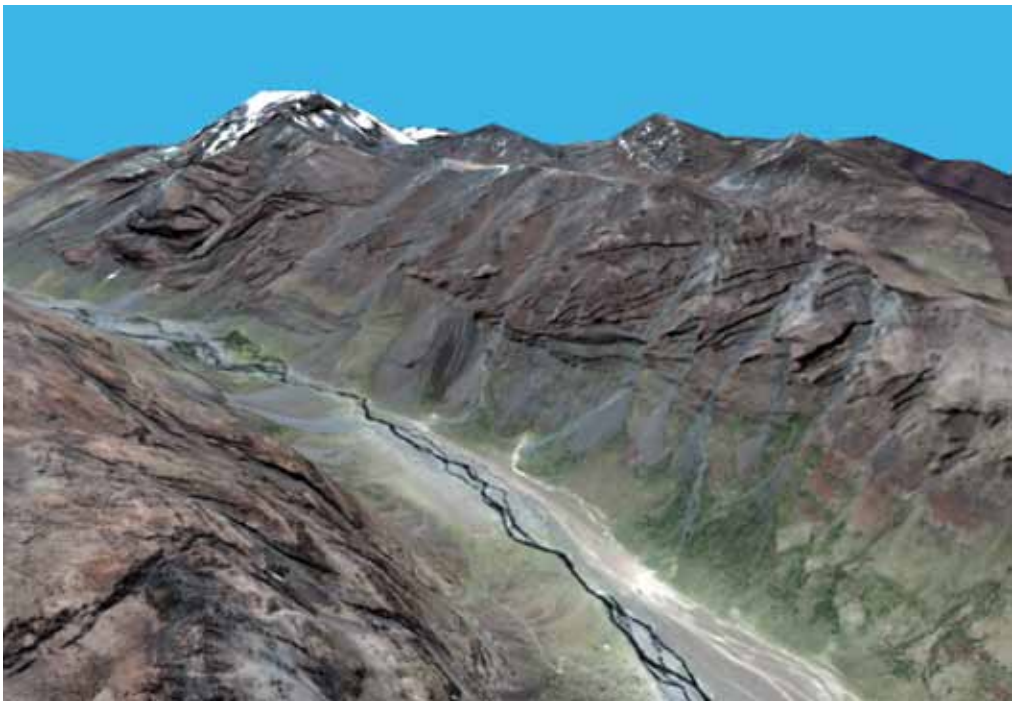


Fig.1: Way to Nyari Gompa and Drira Phuk : Starting point of Parikrama

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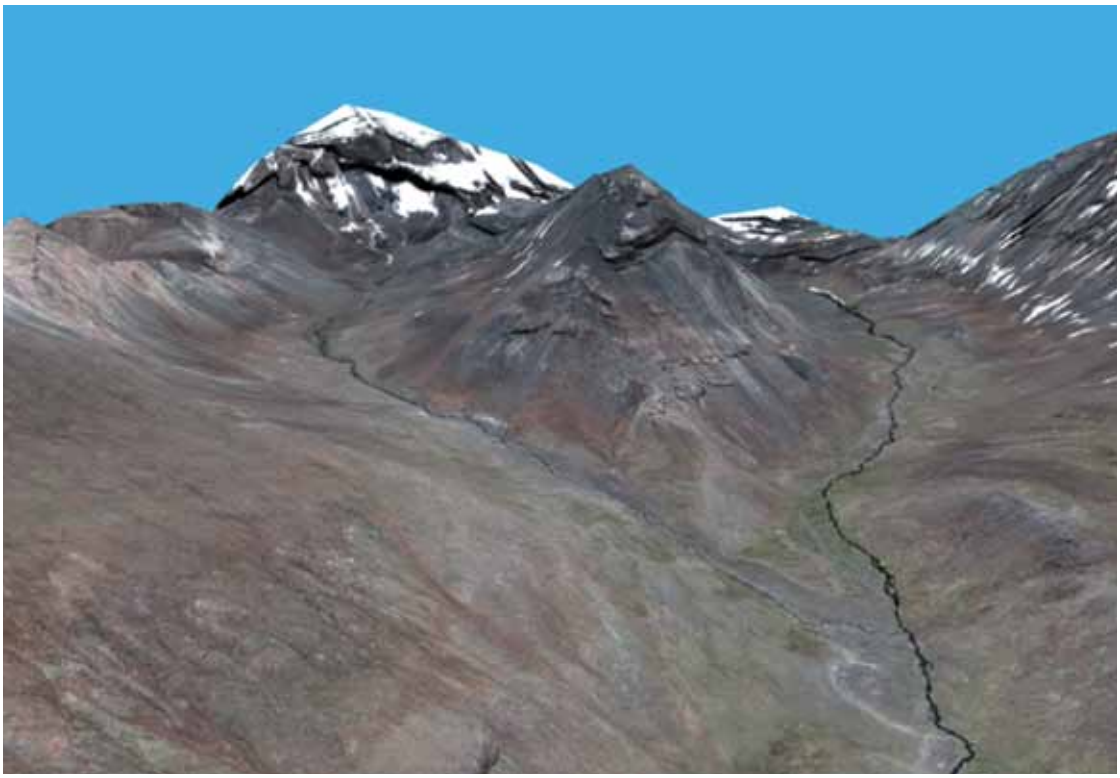


Fig.2: Nandi hill with Mount Kailash in the background

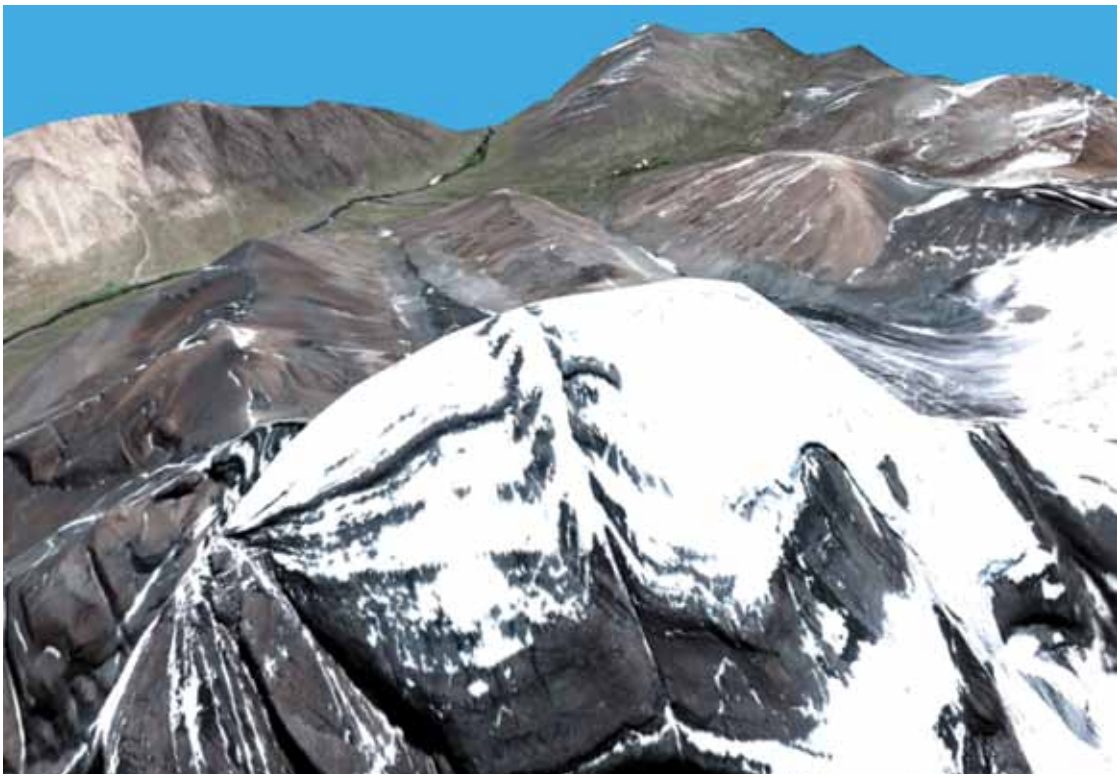


Fig.3: Top view of Kailash showing ladder like structure

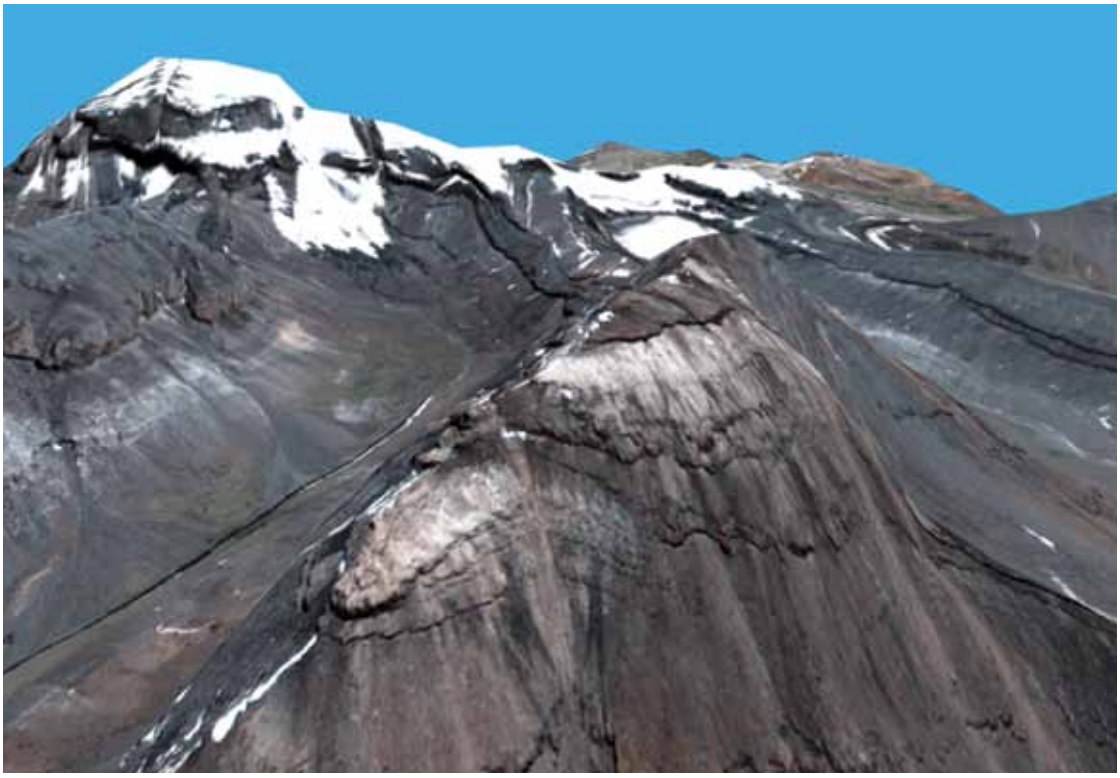


Fig.4: Dharma King Norsang with Kailash in the background

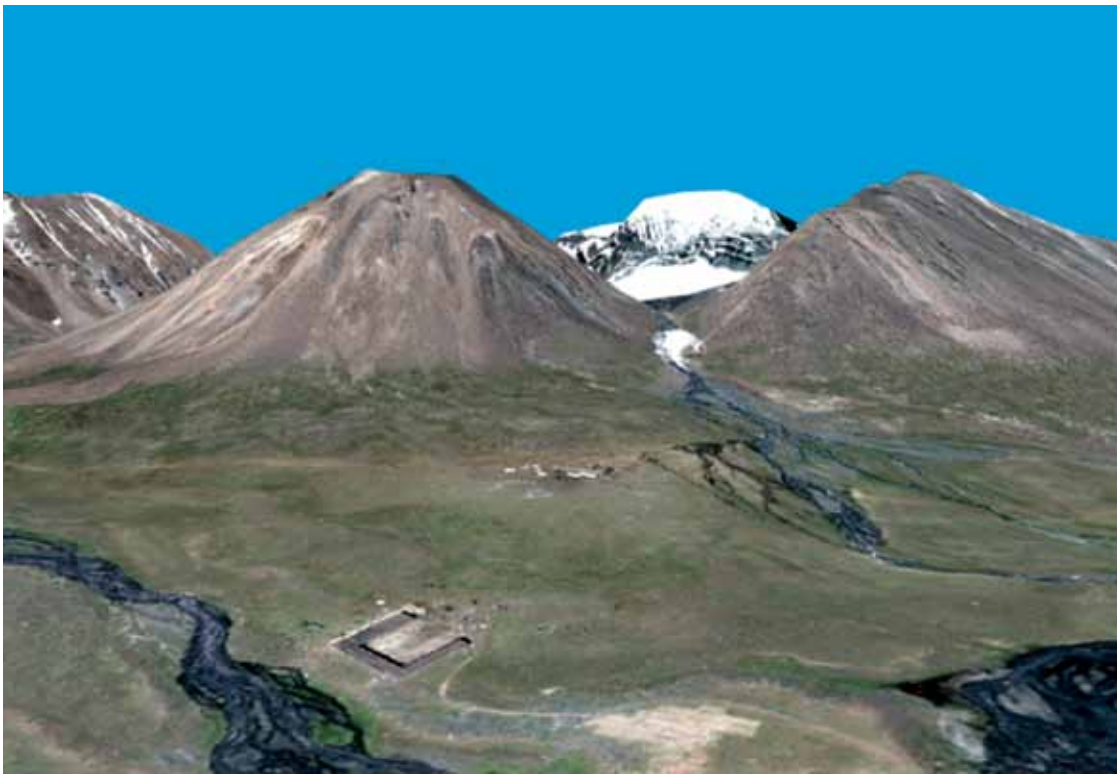


Fig.5: View of Kailash from Drira Phuk monastery

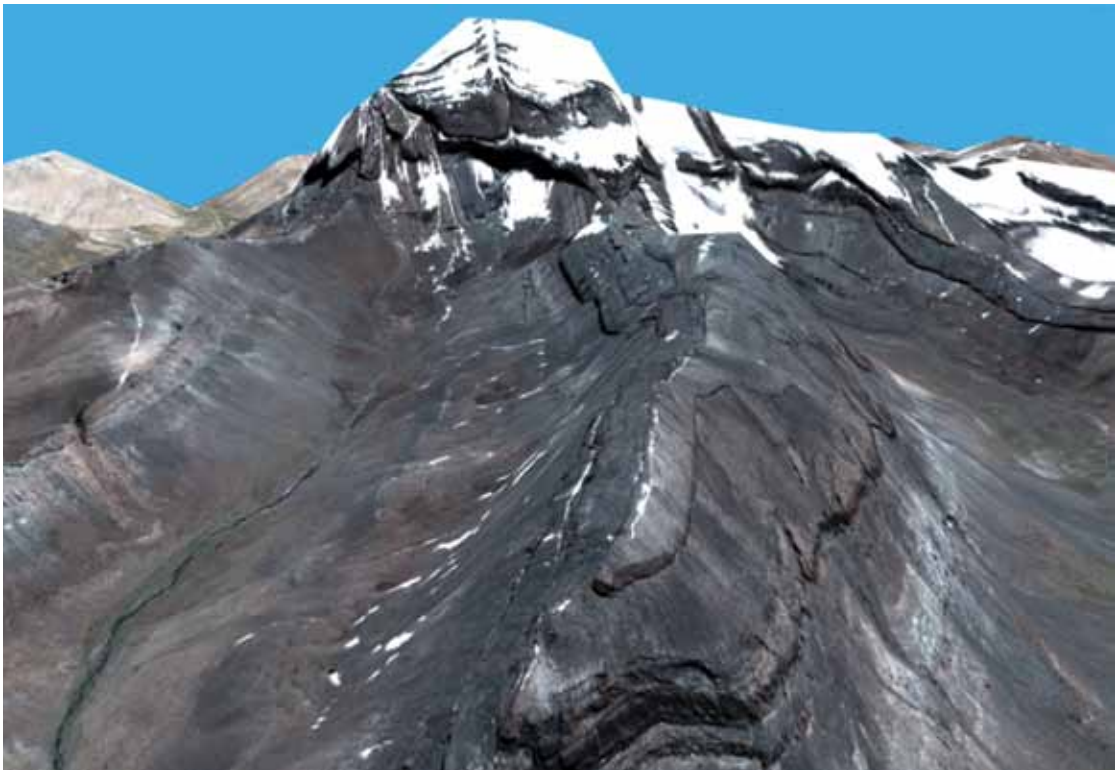


Fig.6: Top view of Nandi Hill with Kailash in the background

Fig.7: Kapal Tso (Origin of river Saraswati) at the base of Nandi Hill

Note : Walk or fly thru Kailash Area - A 3D Presentation see Video enclosed.

Chapter - 04

Archaeological Studies

• Rocks and Ruins found around Kailash	Photo Gallery
• Archaeological remote sensing	Tom Sever
• The pre-Buddhist archaeological sites around Mount Kailash (Ti-se). A major center of civilization in ancient upper Tibet	John Vincent Bellezza

Introduction

Archaeologists want to know how ancient people successfully adapted to their environments and the factors that may have led to collapse or disappearance of old structures, buildings and temples. Remote sensing can be used for detecting surface and shallow depth archaeological formations in a rapid and accurate manner. Tom Sever discusses the technology of Remote sensing by which the characteristics of objects of interest can be identified and measured without direct exploration.

The articles in this chapter describe the various Remote Sensing instruments and computational techniques that can be used to discover the buried structure. The article by John Vincent Bellezza explains about archaeological sites around Kailash that were explored and documented. He is an archaeologist who visited Tibet regularly every year for last twenty to twenty five years, investigating the archaeological sites in Northern Tibet. He also joined the team in 2009 to look for Ashtapad site in the Mt. Kailash area.

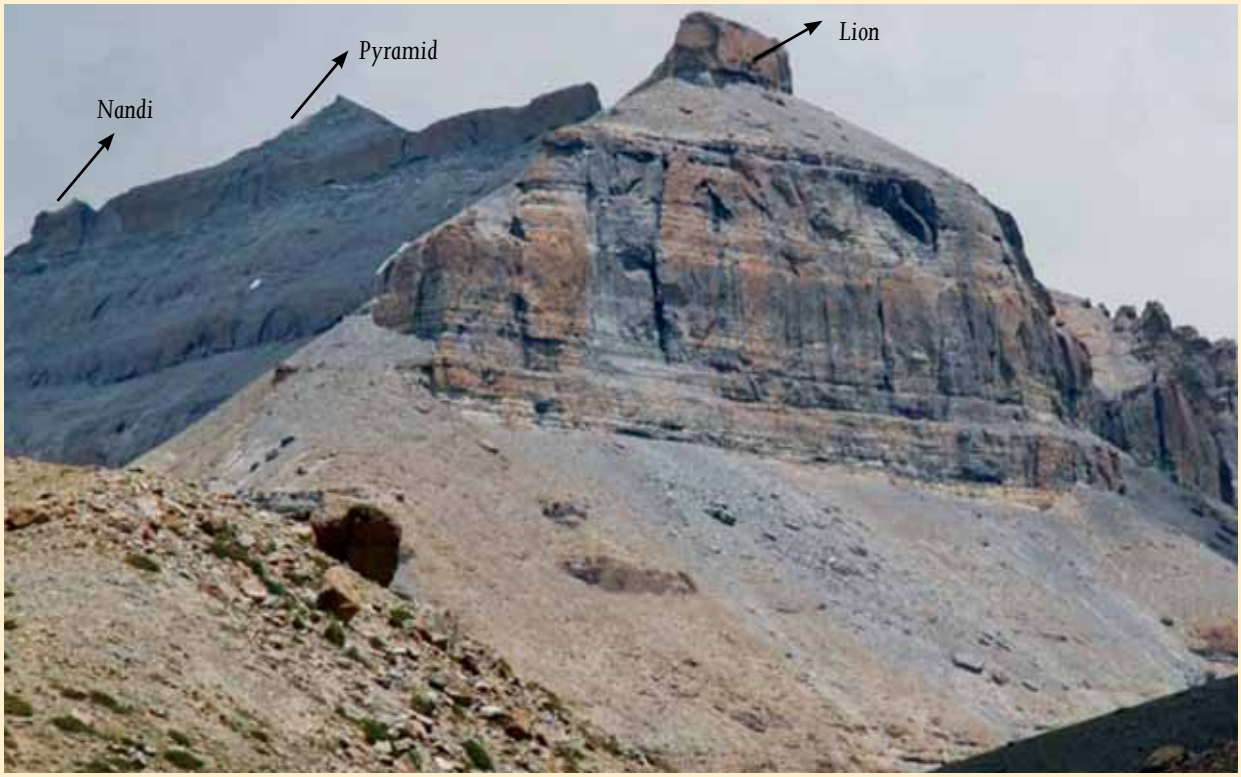
Photos of rocks and ruins found around Kailash area are given in this chapter.

A view of hills opposite Nyari Gompa

High eastern Serlung valley, View of ridge north of Gyangdrag amphitheatre

A view of hills opposite Nyari Gompa

Glaciated valley southeast of Kailash Mountain with differential erosion of conglomerate and shale

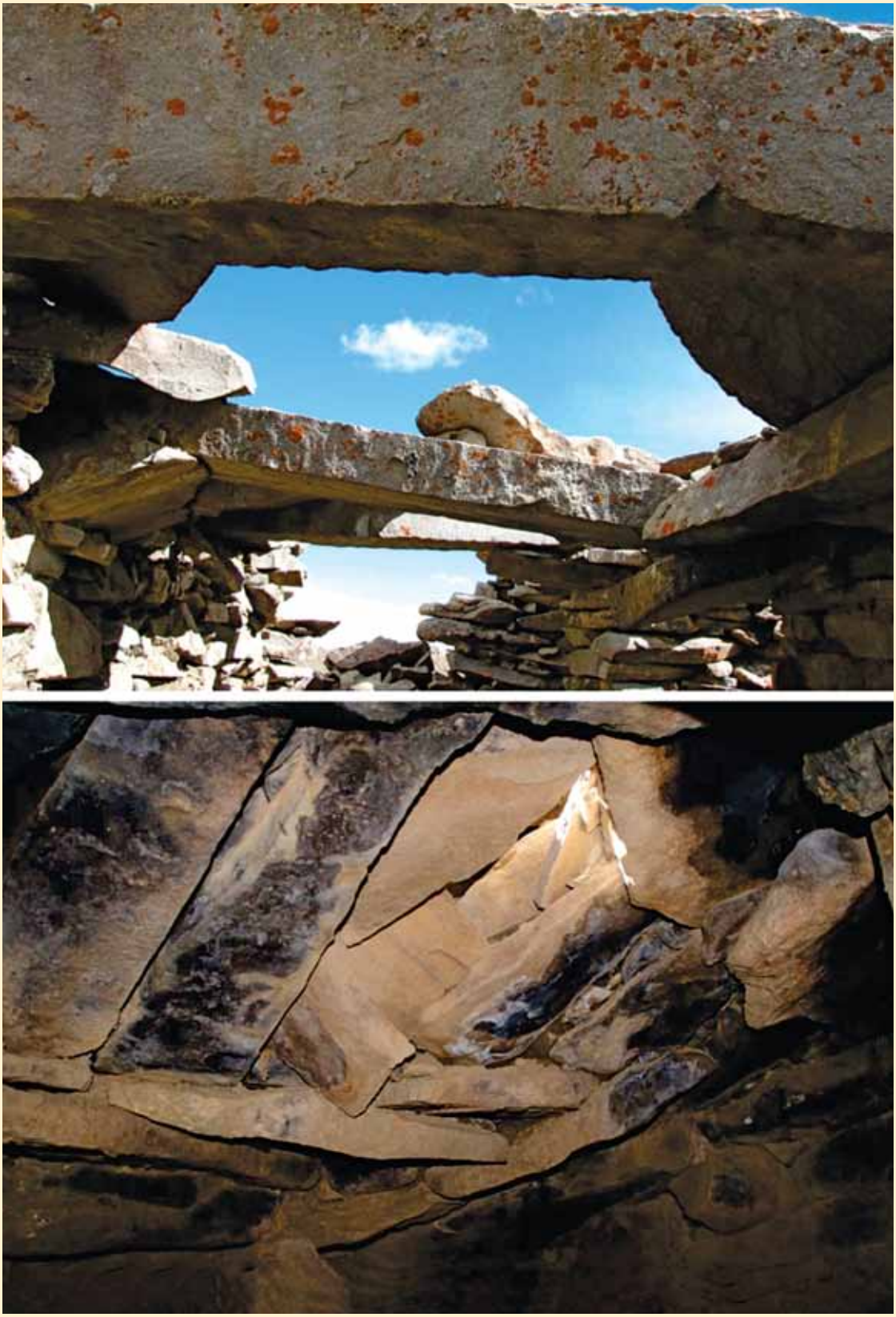


Frost shattered rock covered slope (scree slope)

A view of Kailash from Darchen

Zhang Zhung cliff dwellings at Seldra, Serlung valley

Hill opposite Nyari Gompa, Natural Formation of Rocks



Details of the all-stone roofs of two Zhang Zhung Dokhangs

Drira Phuk ruin and environs, ~100 m above alley

A Zhang Zhung era all-stone habitation at Gyangdrag

Rock- Conglomerate Stone

Ruins of a Dwelling

Ruins of a Dwelling

Rock- Conglomerate Stone

Inner layout of the abandoned house, Mud covered roof of the abandoned house & Rocks seen while trekking in Kailash area during Parikrama

Plaster of wall

Large pieces of Stone

Block – Cemented pieces

One above the other Stone

Mountain Blocks

Layers of Stones

Joint material sampling

Detail of ceiling and walls in highest Dokhang of Lungten Phuk

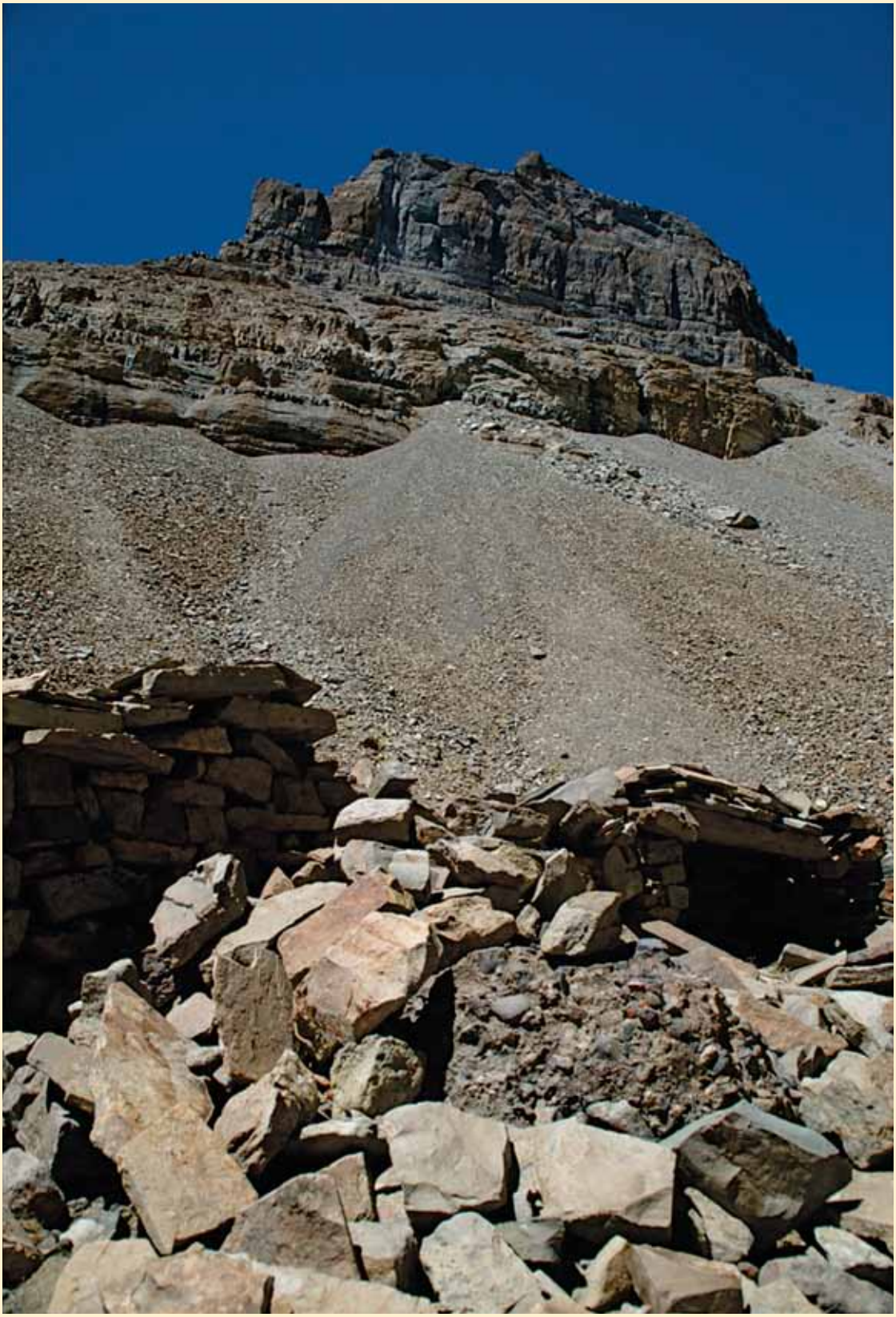
Dokhang traces around a red rock outcrop, Gyangdrag

Dokhang built into a cliff at Lungten Phuk

The highest Dokhang at Lungten Phuk

Ruined Dokhang at Gyangdrag in direct view of Mount Kailash

Traces of Dokhang wall at Drira Phuk



High Dokhang and Mount Nandi base

13 Archaeological Remote Sensing

Tom Sever

Now more than ever, archaeological research is interdisciplinary: botany, forestry, soil science, hydrology - all of which contribute to a more complete understanding of the earth, climate shifts, and how people adapt to large regions.

As a species, we've been literally blind to the universe around us. If the known electromagnetic spectrum were scaled up to stretch around the Earth's circumference, the human eye would see a portion equal to the diameter of a pencil. Our ability to build detectors that see for us where we can't see, and computers that bring the invisible information back to our eyesight, will ultimately contribute to our survival on Earth and in space.

The spectrum of sunlight reflected by the Earth's surface contains information about the composition of the surface, and it may reveal traces of past human activities, such as agriculture. Since sand, cultivated soil, vegetation, and all kinds of rocks each have distinctive temperatures and emit heat at different rates, sensors can "see" things beyond ordinary vision or cameras. Differences in soil texture are revealed by fractional temperature variations. So it is possible to identify loose soil that had been prehistoric agricultural fields, or was covering buried remains. The Maya causeway was detected through emissions of infrared radiation at a different wavelength from surrounding vegetation. More advanced versions of such multi-spectral scanners (Visible & IR) can detect irrigation ditches filled with sediment because they hold more moisture and thus have a temperature different from other soil. The ground above a buried stone wall, for instance, may be a touch hotter than the surrounding terrain because the stone absorbs more heat. Radar can penetrate darkness, cloud cover, thick jungle canopies, and even the ground.

Remote sensing can be a discovery technique, since the computer can be programmed to look for distinctive "signatures" of energy emitted by a known site or feature in areas where surveys have not been conducted. Such "signatures" serve as recognition features or fingerprints. Such characteristics as elevation, distance from water, distance between sites or cities, corridors, and transportation routes can help to predict the location of potential archaeological sites.

Computational techniques used to analyze data

1. Sun-angle correction
2. Density slicing
3. Band ratioing

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Original Source - http://weather.msfc.nasa.gov/archeology

Ref. Vol. XII Ch. 86 D & E Pg. 5506-5510

4. Edge enhancement
5. Synthetic color assignment
6. Filtering
7. Multichannel analysis

Remote Sensing Instruments

Aerial Photography

Many features which are difficult or impossible to see standing on the ground become very clear when seen from the air. But, black and white photography only records about twenty-two perceptible shades of gray in the visible spectrum. Also, optical sources have certain liabilities, they must operate in daylight, during clear weather, on days with minimal atmospheric haze.

Color Infrared Film (CIR)

Detects longer wavelengths somewhat beyond the red end of the light spectrum. CIR film was initially employed during World War II to differentiate objects that had been artificially camouflaged. Infrared photography has the same problems that conventional photography has, you need light and clear skies. Even so, CIR is sensitive to very slight differences in vegetation. Because buried archaeological features can affect how plants grow above them, such features become visible in color infrared photography.

Thermal Infrared Multispectral Scanner (TIMS)

A six channel scanner that measures the thermal radiation given off by the ground, with accuracy to 0.1 degree centigrade. The pixel (picture element) is the square area being sensed, and the size of the pixel is directly proportional to sensor height. For example, pixels from Landsat satellites are about 100 feet (30 m) on a side, and thus have limited archaeological applications. However, pixels in TIMS data measure only a few feet on a side and as such can be used for archaeological research. TIMS data were used to detect ancient Anasazi roads in Chaco Canyon, NM.

Airborne Oceanographic Lidar (ADI)

A laser device that makes "profiles" of the earth's surface. The laser beam pulses to the ground 400 times per second, striking the surface every three and a half inches, and bounces back to its source. In most cases, the beam bounces off the top of the vegetation cover and off the ground surface; the difference between the two give information on forest height, or even the height of grass in pastures. As the lidar passes over an eroded footpath that still affects the topography, the pathway's indentation is recorded by the laser beam. The lidar data can be processed to reveal tree height as well as elevation, slope, aspect, and slope length of ground features. Lidar can also be used to penetrate water to measure the morphology of coastal water, detect oil forms, fluorescent dye traces, water clarity, and organic pigments including chlorophyll. In this case, part of the pulse is reflected off the water surface, while the rest travels to the water bottom and is reflected. The time elapsed between the received impulses allows for a determination of water depth and subsurface topography.

Synthetic Aperture Radar (SAR)

SAR beams energy waves to the ground and records the energy reflected. Radar is sensitive to linear and geometric features on the ground, particularly when different radar wavelengths and different combinations of the horizontal and vertical data are employed. Different wavelengths are sensitive to vegetation or to ground surface phenomena. In dry, porous soils, radar can penetrate the surface. In 1982, radar from the space shuttle penetrated the sand of the Sudanese desert and revealed ancient watercourses. Using airborne radar in Costa Rica, prehistoric footpaths have been found.

Microwave Radar

Beaming radar pulses into the ground and measuring the echo is a good way of finding buried artifacts in arid regions (water absorbs microwaves). Man-made objects tend to reflect the microwaves, giving one a "picture" of what is underground without disturbing the site.

Archaeology - Excerpts from an Article

Archaeological view of an Ancient settlement

Much of human history can be traced through the impacts of human actions upon the environment. The use of remote sensing technology offers the archaeologist the opportunity to detect these impacts which are often invisible to the naked eye. This information can be used to address issues in human settlement, environmental interaction, and climate change. Archaeologists want to know how ancient people successfully adapted to their environment and what factors may have led to their collapse or disappearance. Did they overextend the capacity of their landscape, causing destructive environmental effects which led to their demise? Can this information be applied to modern day societies so that the mistakes of the past are not repeated?

Remote sensing can be used as a methodological procedure for detecting, inventorying, and prioritizing surface and shallow-depth archaeological information in a rapid, accurate, and quantified manner. Man is a tropical creature who has invaded every environment on earth successfully; now we are ready to explore, and eventually colonize, the delicate environments of Space. Understanding how ancient man successfully managed Earth is important for the success of current and future societies.

The stereotype has archaeologists just digging up spearheads and pottery and anthropologists just writing down the words of primitive tribes. But we're examining how people adapted to their environment throughout time, how they experienced environmental shift, why cultures

come and go. Soils associated with artifacts are as important as the artifacts themselves—probably more relevant to us than the actual objects. Now more than ever, archaeological research is interdisciplinary: botany, forestry, soil science, hydrology-all of which contribute to a more complete understanding of the earth, climatic shifts, and how people adapt to large regions. This understanding is critical to future decision making affecting the planet.

In Costa Rica, the culture survived repeated volcanic explosions that repeatedly destroyed the environment, explosions equal to the force of a nuclear blast. Other cultures, like the advanced May a societies, did not survive or recover from similar eruptions. Did it have to do with the size and violence of the eruption, the way they farmed their land overtime, or territorial and political struggle?"

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Responsible Official: Dr. Steven J. Goodman (steven.goodman@nasa.gov)

14 The pre-Buddhist archaeological sites around Mount Kailash (Ti-se). A major center of civilization in ancient upper Tibet

John Vincent Bellezza

An introduction to the pre-Buddhist archaeological sites of Mount Kailash

Mount Kailash has been the focus of religious pilgrimage for many centuries. It is mentioned in the Puranas and in Jain literature, confirming the long standing importance of this mountain to practitioners of various Indic religious traditions. Most Sanskrit accounts of Mount Kailash explain its significance in religious terms, as a place associated with the divinities and great sages of yore. Sanskrit literature also extols the divine beauty of the mountain. Tibetan Bon and Buddhist literature has more or less followed in this same vein, exalting Mount Kailash as a place of wonder and holiness.

The ancient attraction of Mount Kailash can be also understood from an archaeological perspective, providing a new context in which to assess the literary sources pertaining to it. Still not well known is that this sacred mountain was a major center of early settlement in the region. Lofty Mount Kailash hosted a string of high altitude temples and retreats built in the period before the modern day Bon and Buddhist religions (collectively known as Lamaism) came to dominate Tibet. In fact, the sum total of permanent settlement at Mount Kailash in the period before 1000 CE was considerably greater than in more recent times.

The early historic period (650–1000 CE)and protohistoric period (100 BCE– 650 CE) settlements of Mount Kailash were virtually unknown until the 2000's, when in a series of annual expeditions the present author comprehensively documented them. Archaic or pre-Buddhist residency patterns at Mount Kailash contrast with those that developed in later times. As anyone who has gone around this scared mountain should know, there are four Buddhist monasteries on the circumambulatory trail and two more in what is commonly called the inner circuit (*nang-skor*). Additionally, there were a few rudimentary houses belonging to herders at Darchen (located on the southside of the mountain) and a small handful of retreat caves used by ascetics. That was the extent of the residential footprint at Mount Kailash until well into the 1980s. On the other hand, the archaic era (before 1000 CE) temples and residences are situated high above the circumambulatory trail in very isolated locations. After 1000 CE, these sites appear to have been used only sporadically by Buddhist anchorites looking for places in which to meditate.

As in most other areas of the vast Tibetan upland, after circa 1000 CE, the patterns of permanent residency at Mount Kailash radically shrank. In the archaic era, temples and castles were

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established at heights upto 5400 m. However, in the Lamaist era (1000–1950 CE), large installations were not built above 4800 m. The cultural rigor of the pre-Buddhist inhabitants and the deterioration of the climate appear to mostly account for this retreat from the higher elevation belt. The permanent residential infrastructure also became less dense in the Lamaist era. Many locales inhabited up to early historic times were subsequently abandoned and left to herders who exploited them on a seasonal basis (continuing to this very day). Depopulation and a decline in political fortunes also seem to be vital causal factors involved in this hollowing out of sedentary settlement at Mount Kailash.

In total, there were fourteen major loci of archaic settlement at Mount Kailash, all of which are now vacated, save for visitation by an occasional pilgrim or adept. This chain of ruined sedentary settlements clearly demonstrates that Mount Kailash was once far more populated than in Lamaist times. Also, the nature of these early constructions suggests that at least in some ways the pre-Buddhist inhabitants were culturally more advanced than their Lamaist counterparts. In any event, the style of construction used in archaic era edifices relied on sophisticated masonry techniques that fell out of favor in Upper Tibet by circa 1000 CE.

Where the architectonic character of pre-Buddhist temples and citadels can be appraised, they all share the same style of construction, which is best described as 'all-stone corbelled architecture'. This type of building is extremely rugged and durable, thus it is very well adapted to the extremely harsh climatic conditions of Upper Tibet. In these all-stone corbelled structures, rock members were placed on the tops of walls as load bearing devices for the stone roof assembly. Bridging stones were laid diagonally or crosswise over the corbels in order to span the distance between opposite walls. The corbels and bridging stones acted as support for the heavy stone sheathing from which roofs were constructed. The elementary corbelling technique employed in Upper Tibet was only suitable for use in small interior spaces (typically 3 m^2 to 12 m^2). Walls in this form of construction are relatively thick (between 60 cm and 1.2 m), and of a slab or block random-rubble texture. The walls exhibit both dry mortar and clay mortar seams. Exterior and interior corners tend to have a rounded quality, as this facilitates the arrangement of corbels. Interior walls are frequently punctuated with buttresses that function to support intervening series of corbels and roof appurtenances. The floor-to-ceiling height of rooms is relatively low (1.6 m to 2.1 m). Most buildings are windowless, and even in structures where there are interior and exterior window openings, these are tiny. Single buildings contain between two and one dozen rooms, which are normally arranged in rows or in isolated aggregations. Rooms directly open onto one another or are connected through short corridors. Another defining feature of all-stone corbelled edifices is the very small size of their doorways; these average only around 1.1 m in height.

A selection of pre-Buddhist residential settlements around Mount Kailash

The ruins of Mount Kailash Bon Castle are perched on a summit with excellent views of the Barkha plains, Lake Manasarovar and Rakshas Tal. This small installation appears to have functioned as a surveillance post for the ancient Mount Kailash communities.

Fig.1: The ruins of Mount Kailash Bon Castle (Gangs ti-se'ibon-mkhar)

Perched on an eponymous outlier (elevation 5100 m), Mount Kailash Bon Castle also overlooks the Serlung valley. Mount Kailash Bon Castle is one of the only sites at Mount Kailash that local residents (*gangs-ri-ba*) concede as having belonged to the early Bon Po. It is now used to hang prayer flags and to make incense offerings to the protective deities.

Fig.2: Mighty Mountain Fortress (Gnyan-pori-rdzong). The forward wall of one of the buildings. Note the intact stone lintel over the doorway

This probable temple complex is situated high above the east side of the circumambulatory path. The approach to the site is very difficult and this must have endowed it with a strong strategic capability. From this location defenders could restrict access to much of the Mount Kailash circuit trail. Mighty Mountain Fortress consists of the remains of seven buildings. Worked stones up to 90 cm in length are found in the walls, and tiny flat pieces of stones were frequently used to chink the joints between larger stones. A tally of individual rooms at Mighty Mountain Fortress suggests that when fully active this installation could have sheltered as many as fifty people.

Fig.3: Famous Walls (Gyang-grags). One of the most intact ancient residences at this very high elevation site

Located above the monastery also known as Famous Walls, in the inner circuit of Mount Kailash, there are no less than thirty carcasses of all-stone corbelled residences. In addition to these individual domiciles spread out in the heights, there are the remains of larger structures in the vicinity of the Buddhist monastery. At least several hundred of people may have once populated this location. Famous Walls occupies a special place of importance in Bon historical conceptions concerning the ancient kingdom of Zhang Zhung. It is written that it was the capital of the Zhang Zhung King of Existence, Khri-wer la-rje, the holder of the golden horns of the bird headdress. It is thought that this figure was the prime benefactor of the founder of the Bon religion, gShen-rab. Two other Zhang Zhung kings connected to Famous walls were Zhung-zhagzil-gnonrgyal-porlabs-chen, holder of the eagle horns of the bird; and Hri-do gyer-spungsrgyal-pokang-ka, holder of the crystal horns of the bird. The archaeological record agrees with Bon quasi-historical and legendary texts, in that Famous Walls was certainly the site of significant cultural activity and human settlement in the archaic era.

Fig.4: Famous Walls. The remains of the highest ancient residence at Famous Walls and perhaps in all of Tibet (possibly the highest in the entire world as well). This monument is situated at more than 5400 m in elevation. It was first documented on the Shri Ashtapad expedition to Mount Kailash, in 2009

Fig.5: Prophecy Retreats (Lung-bstanPhuk). The ruins of the highest residence at the site

The fifteen all-stone corbelled structures of this site occupy a narrow gully, an amphitheatre, cliffs, and ridgelines sandwiched between the eastern side of the Mount Kailash outer circuit and the inner circuit. One thousand years ago, Buddhists meditators occupied Prophecy Retreats, lending it the name it is still known by. The adequate shelter offered by the residential structures of Prophecy Retreats must have been attractive to Buddhist ascetics during their golden period in the region, in the 12th and 13th CE centuries CE. The rear walls of the old buildings are set deeply into the slopes, giving them a semi-subterranean aspect. The larger structures (around 8 m x 12 m) had three tiers of rooms or a forward courtyard and two upper tiers of rooms.

Crystal Likeness is suspended on a steep and rocky slope located in the inner circuit. Although it was founded in the archaic era, Crystal Likeness was used subsequently by Buddhist practitioners for many centuries. One of the retreat buildings was partially restored in the 1980s. Spanning 14 m of the cliff face, the modern retreat has incorporated older structures into its construction. On the north side of this hermitage, there are three small rooms, two of which still have fully intact stone slab roofs supported by corbels. Southwest of the modern hermitage are the vestiges of five small buildings. Further west is a pre-Buddhist residence ensconced in an overhang.

Fig.6: Crystal Likeness (Shel-'dra). Ruins on the west side of the site

Cave of the Letter A is located directly above the Buddhist monastery of rDzu-'phrulPhuk, on the east side of the pilgrim's circuit. A 14.5-m long outer retaining wall was built up around a cave, forming a 3-m- to 6-m wide level area in front of it. Bon tradition maintains that practitioners such as the famous adept Tshe-dbang rig-'dzin (8th century CE) stayed in this cave. However, since the 11th century CE, Cave of the Letter A has been under the control of the Buddhists. Tibetan Buddhists commonly believe that it was used by the great saint Mi-la

ras-pa (1040–1123 CE) for meditation. Cave of the Letter A is now in a state of disrepair.

Fig.7: The interior of Cave of the Letter A (A-Phuk)

This archaic site now carries the name of a well-known lama, Zhabs-dkar-potshogs-drug rang-grol (1781–1851 CE). Evidently, this adept occupied just one subterranean cave at the site. Nevertheless, in ancient times, the so-called Zhabs-dkar Meditation Cave hosted a large residential complex. The main edifice measured 11.5 m (north-south) x 26 m (east-west). There are also smaller ruined residential complexes at Zhabs-dkar Meditation Cave.

Fig.8: A view of the main edifice of Zhabs-dkar Meditation Cave (Zhabs-dkarsgrub-Phuk)

Fig.9: One of the structures at palace of the Medicine Buddhas (sMan-bla pho-brang). Note the intact rear room and corbel assembly.

The archaeological site of Palace of the Medicine Buddhas is named after the mountain upon which it reposes. The extensive structural remains indicate that this residential site was larger than any of the contemporary Buddhist monasteries at Mount Kailash. There are three large all-stone corbelled complexes at palace of the Medicine Buddhas, representing a very important nucleus of early settlement at Mount Kailash. At one time, many dozens of people must have lived and worked at this location.

Female Yak Horn Retreats is also the name of a Buddhist monastery established below the archaic ruins after 1000 CE. According to the Bon tradition, this site is where the chief god of Zhang Zhung, Ge-khod, first manifested from the sky as a wild yak. That this was indeed an important archaic residential site is confirmed by the existence of seventeen all-stone corbelled residences on the slopes above the Buddhist monastery. These structures are almost unknown and not even local monks are familiar with their history, so well was information about Tibet's pre-Buddhist cultural past suppressed.

Fig.10: Female yak horn retreats ('Bri-ruPhuk). seen here are part of the ruins of the building designated DK1

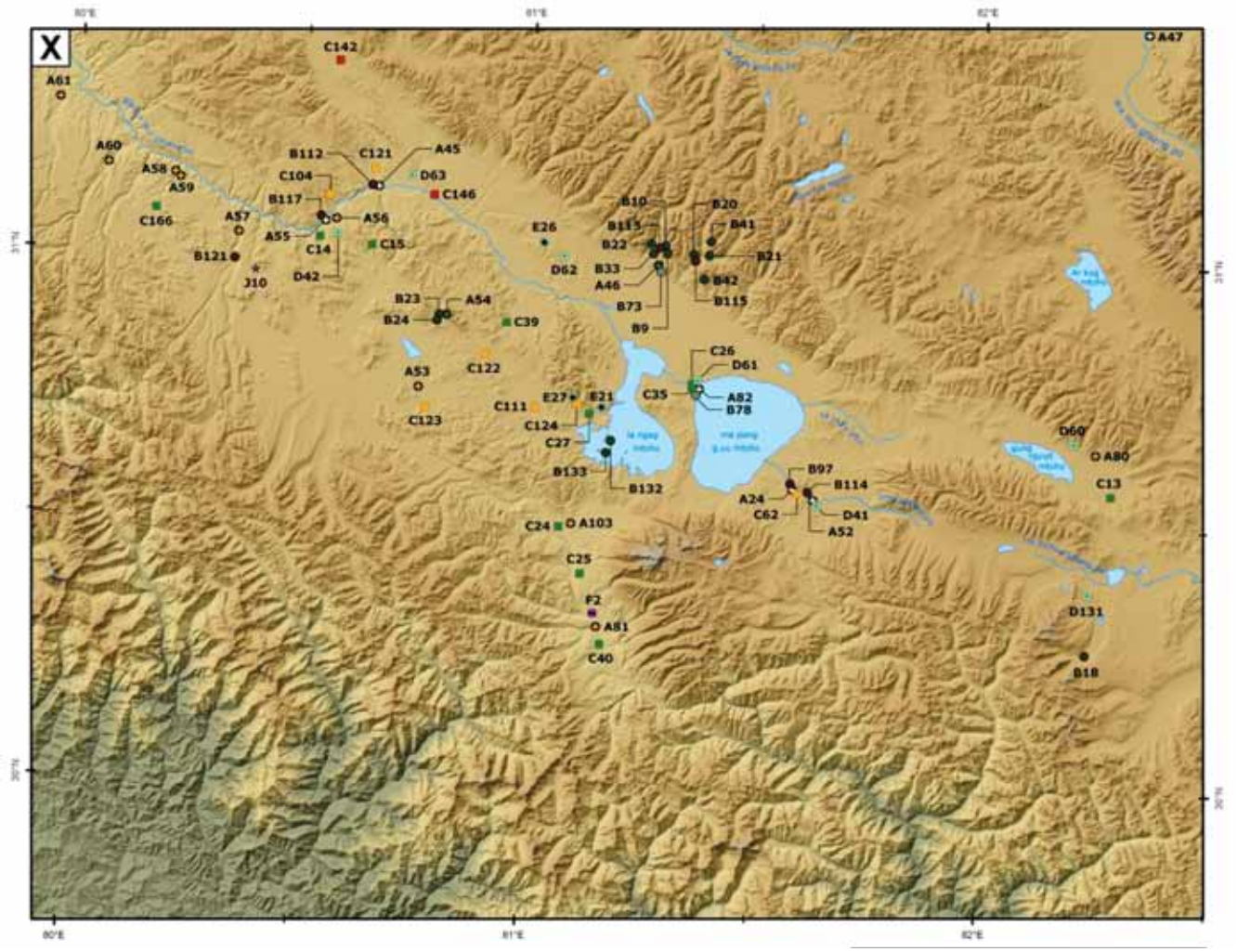
For more information about the archaic archaeological sites of Mount Kailash, see the following works by the author:

2006–2012. Flight of the KhyungNewsletter.http://www.tibetarchaeology.com

2011a. Antiquities of Zhang Zhung: A Comprehensive Inventory of Pre-Buddhist sites on the Tibetan Upland, Residential Monuments, vol. 1. The Tibetan & Himalayan Library.http://www.thlib.org/bellezza

2008. Zhang Zhung: Foundations of Civilization in Tibet. A Historical and Ethnoarchaeological Study of the Monuments, Rock Art, Texts and Oral Tradition of the Ancient Tibetan Upland.Philosophisch-HistorischeKlasseDenkschriften, vol. 368. Wien:Verlag der ÖsterreichischenAkademie der Wissenschaften.

2002.Antiquities of Upper Tibet: An Inventory of Pre-Buddhist Archaeological sites on the High Plateau, Delhi: Adroit Publishers.



Residential Monuments

Residential structures occupying summits

- I.1a *All-stone corbelled buildings*
- I.1a *Edifices built with timbers*
- I.1a *Solitary rampart networks*
- I.1a *Indeterminate subtype*

Residential structures in all other locations

- 12a *All-stone corbelled structures*
- 12b *Other freestanding building types*
- 12c *Buildings integrating caves and escarpments in their construction*
- I.2x *Indeterminate subtype*

Agricultural Structures

- III

Earthworks

- IV

Ceremonial Monuments

Stelae ana accompanying structures

- II.1a *Isolated pillars*
- II.1b *Pillars erected within a quadrate enclosure*
- II.1c. *Quadrangular arrays of pillars appended to edifices*

Superficial structures (primarily funerary superstructures)

- II.2

Cubic-shaped mountaintop tombs

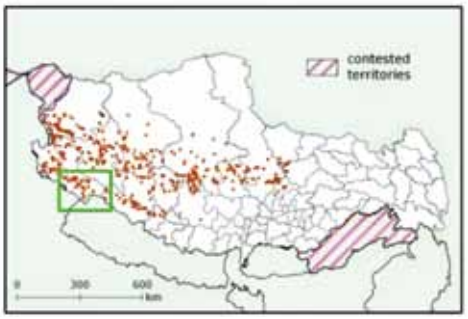
- II.3

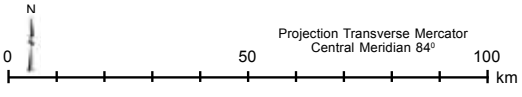
Shrines, minor stone constructions and miscellaneous structures

- II.4

Rock Art

- V.1 Petroglyphs
- V.2 Pictographs





Map M132

Name : Upper Tibet Regional Series
- Bellezza archaeological sites - X

Scale : 1 : 1 000 000

Or Estimated Scale
(1) Extent: 80-82.4 long. / 29.9-31.4 lat.

Or Estimated Extent
(2) Projection System: Transverse Mercator, central meridian 84°

Date of Publication
(3) 2009

Publisher: Tibetan & Himalayan Library

Language of features in the map : English

Language of the legend : English

Physical size of the map frame (width*height, in cm) : 24.7*18.8

Part of a series : This map is part of the Upper Tibet Regional Series (UTRS), which is a set of maps on the millionth scale covering all the sites discovered and studied by John V. Bellezza. The maps belonging to this series range from M122 to M134, M122 being the index that shows the distribution of the different maps This series is itself part of the two digital volumes "Antiquities of Zhang Zhung" by John V. Bellezza, published by the Tibetan & Himalayan Library in 2009.

Inset map:

Comments:

(1) When a map lacks scale, an estimated scale is given based on different measurements.

(2) When a map lacks grid, an estimated long/lat extent of the map is given based on different measurements.

(3) When a map lacks publishing date, a terminus post quem and a terminus ante quem of it is given.

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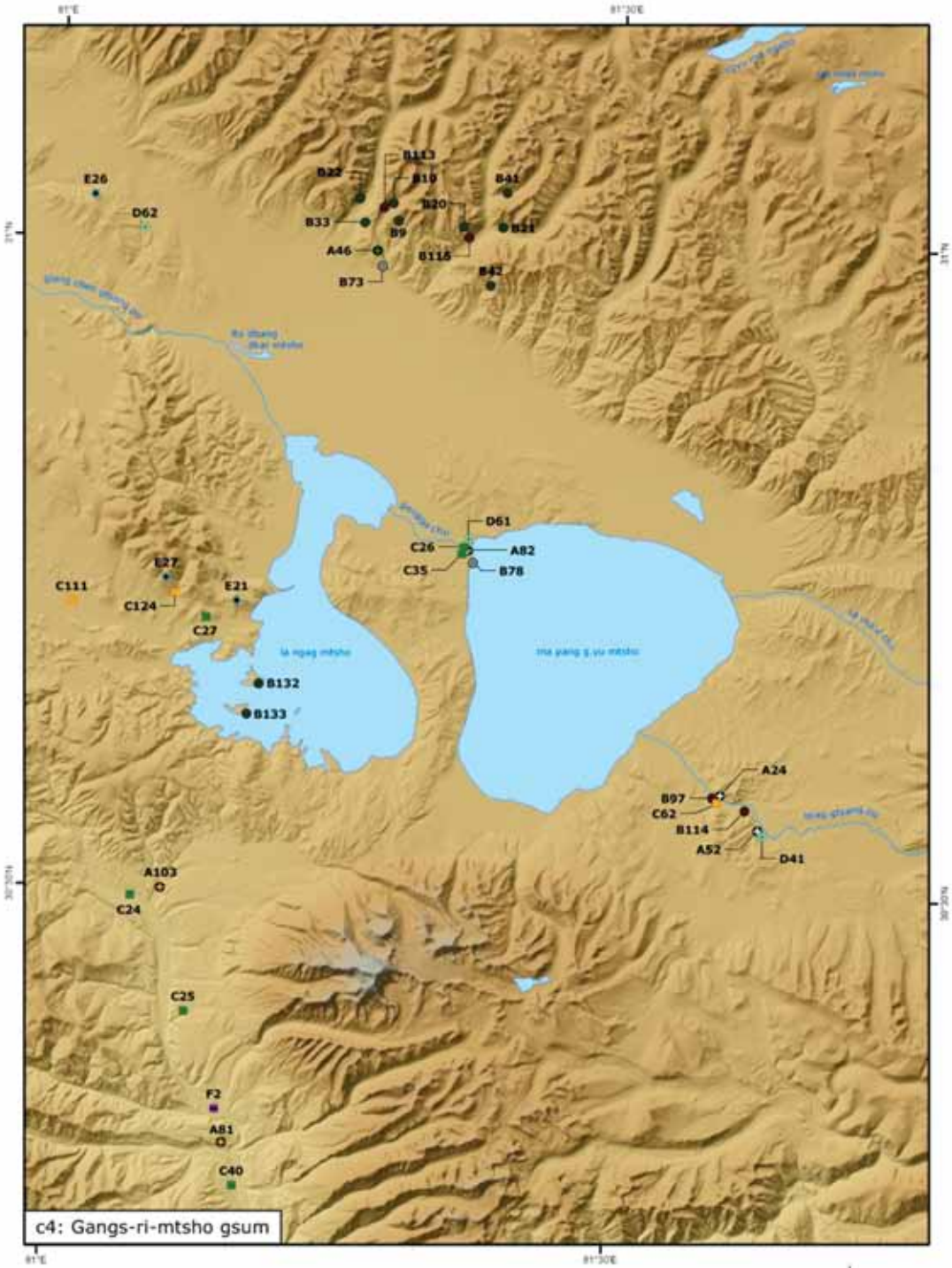


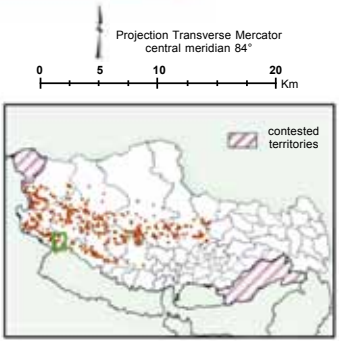
Residential Monuments

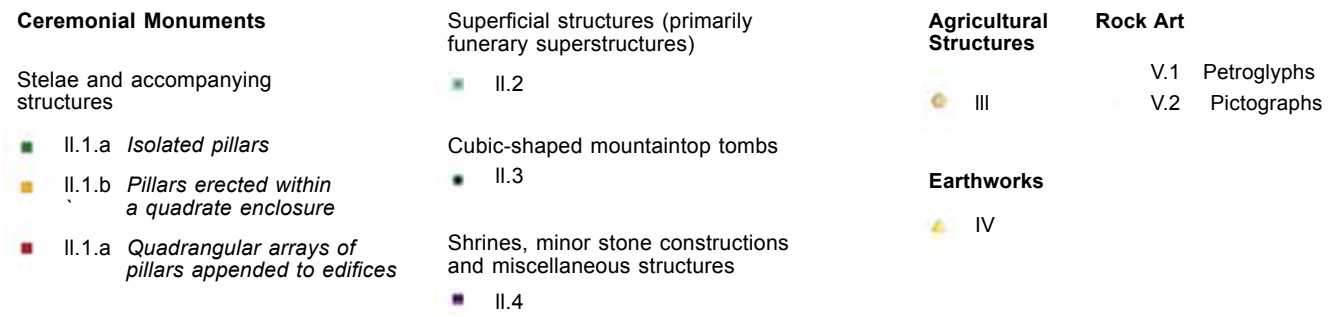
Residential structures occupying summits

- I.1a *All-stone corbelled buildings*
- I.1b *Edifices built with timbers*
- I.1c *Solitary rampart networks*
- I.1x *Indeterminate subtype*

Residential structures in all other locations

- I.2a *All-stone corbelled structures*
- I.2b *Other freestanding building types*
- I.2c *Buildings integrating caves and escarpments in their construction*
- I.2x *Indeterminate subtype*





Map M114

Name: Highlighted Areas Series - Bellezza archaeological sites - c4

Scale: 1 : 394 642

Or Estimated Scale(1) Extent: 81-81.7 long. / 30.2-31.1 lat.

Or Estimated Extent(2) Projection System: Transverse Mercator, central meridian 84°

Date of Publication (3): 2009

Publisher: Tibetan & Himalayan Library

Language of features in the map: English

Language of the legend: English

Physical size of the map frame (width*height, in cm): 19.6*26.4

Part of a series: This map is part of the Highlighted Areas Series (HAS), which is a set of maps covering important areas with high densities of archaeological sites as discovered and studied by John V. Bellezza. The maps belonging to this series range from M106 to M121, M106 being the index that shows the distribution of the different maps.

This series is itself part of the two digital volumes "Antiquities of Zhang Zhung" by John V. Bellezza, published by the Tibetan & Himalayan Library in 2009.

Inset map:

Comments:

(1) When a map lacks scale, an estimated scale is given based on different measurements.

(2) When a map lacks grid, an estimated long/lat extent of the map is given based on different measurements.

(3) When a map lacks publishing date, a terminus post quem and a terminus ante quem of it is given.

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Chapter - 05

Geological Studies

• Nature as a Sculpture as observed in Kailash area	Photo Gallery
• Geology and Geography of Mt. Kailash-Ashtapad and surroundings	Mayur Desai & Ajit Shah
• Central Himalayan Geological observations	Augusto Gansser
• Tectonic design and evolution of the Himalaya	K. S. Valdiya
• Geological investigation of Rock Sculptures around Mount Kailash	Navin Juyal & P.S. Thakker

Introduction

The articles included in this chapter describe the formation and birth of Himalayas, geology and geography around Kailash and the weathering agents such as wind and glaciers that significantly alter the landscape. The seismicity in the Himalayas is constantly occurring and still active at present. Due to this phenomenon the height of Himalayas is rising about 3 to 4 centimeters every year. Article by Mayur Desai and Ajit Shah discusses the above in detail. Dr. A Gansser and Dr. K. S. Valdiya's work is summarized here to learn about geology of central Himalayas.

Three major earth processes that were operated and are still in operation are the glacial, frost and river erosion which have changed the landscape around Kailash and Nandi mountains. The article by Dr. Juyal and Dr. Thakker, "Geological Investigation of Rock Sculpture" in the chapter demonstrates with site photographs, the action of these agents in carving the sculptures on the mountain. These sculptures look like as if someone has carved them with a chisel and hammer and are mistaken for man-made objects. The article also discusses the man-made structures like caves and ruins etc. encountered during the investigation.

Photos about Nature as a sculpture as observed in Kailash area are given here.

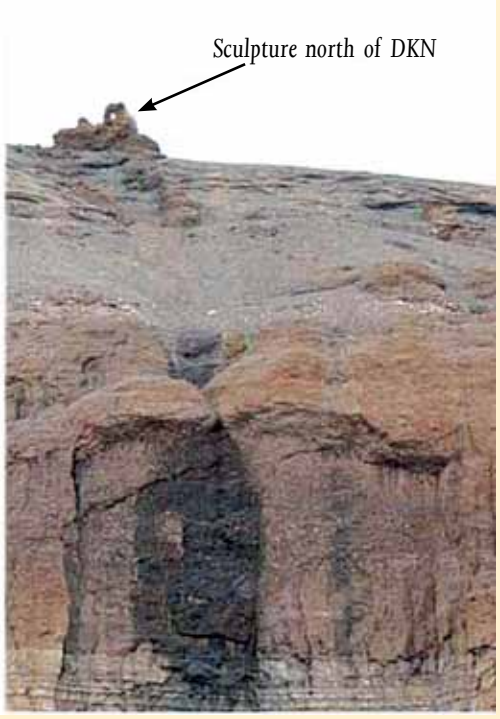
Nature as a Sculpture as observed in Kailash area

A Statue like rock at the top of a hill

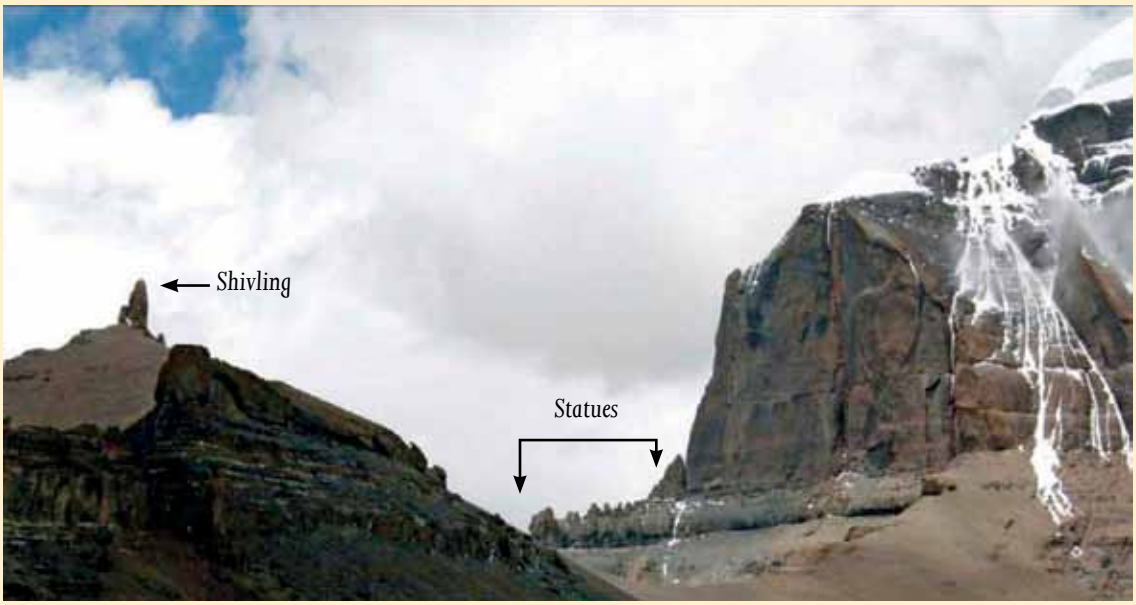
A Statue like rock at the top of a hill

Many stone statues

Hanuman (Monkey Face)



Sculpture carved by snow and wind erosion



Series of pinnacles at the western shoulder of Kailash and Shivling.
These features are formed where two adjacent glacial valleys meet (Arete).
The pinnacles developed due to the combination of frost action and glacial abrasion as discussed in the text.

Statue in Gavax

Rock formations and Caves in the Mountains

Rock formations and Caves in the Mountains

15 Geology and Geography of Mt. Kailash – Ashtapad and Surroundings

Mayur B. Desai and Ajit Shah

Geological Background of Himalaya

The slides and material in this article are taken from a presentation that was made at Jain Center of America, New York in 2010. The slides describe generalized historic geological and climatological forces that existed at the present day Mt. Kailash and its surroundings. More detailed scientific discussions on these topics are presented in various research papers and excerpts presented within Granth II. The followings slides are for the benefit of non-scientific community who will review this Granth.

South face of Kailash

The drifting continental masses creating new crusts and oceans have taken place right from the inception of Earth's origin in our solar system, primarily from the result of flowing molten rock from below the earth's crust for dissipation of internal heat, gravitational forces and earth's rotation as shown in Figure-1. Typical plate (crustal) movements are in the range of 10–40 mm per year. During this process, collision between continents and drifting between them created huge amounts of volcanism resulting in the formation of new crusts and earthquakes. The mega continental drifting process started since 250 million years. and still continuing. One of the

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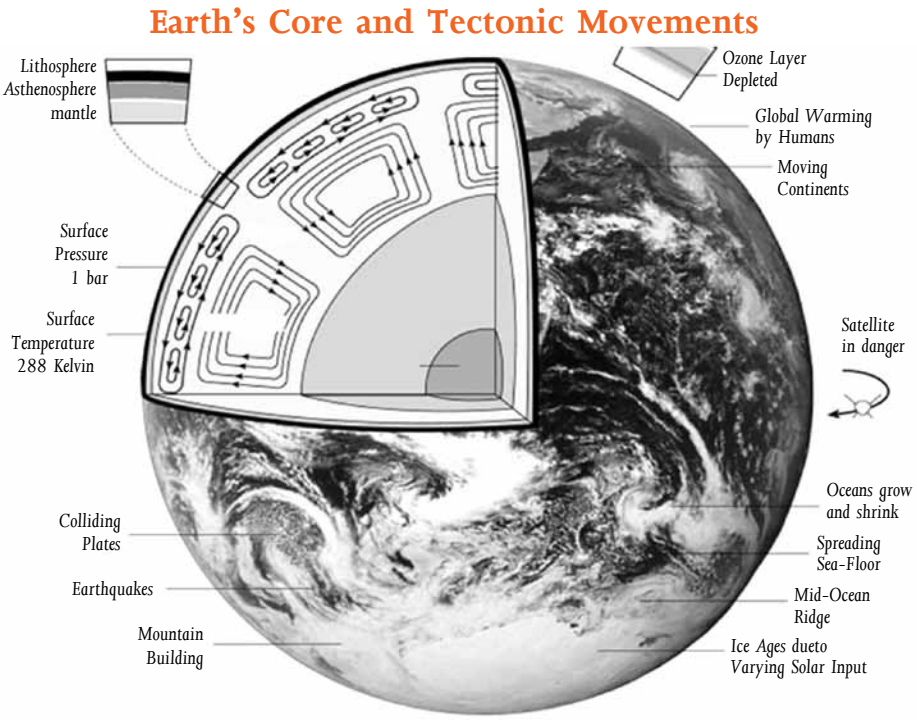

Fig.1: This figure shows the process of movements of solid rocky crust (plate) and the creations of new mountains and oceans during the collisions and drifting of crusts (plates).

main continental collisions has taken place between India and Eurasia as shown in Fugures-2 and 3, creating still rising mountain chains of Himalaya. Over periods of 5-10 million years, the plates will continue to move at the same rate. Geologists postulate that in 10 million years India will plow into Tibet a further 180 km. This is about the width of Nepal. The remnants of Tethys Sea that existed before this collision are still evident in the form of fossilized fish and sea conch found in the higher elevations like at the Mt. Everest and at many places in Himalayas.

Figure-4 shows the geologic formations in the vicinity of Mt. Kailash. The Tsangpo Suture Zone, contact between Indian subcontinent and Eurasian Plate, is clearly visible as a linear feature.

The weathering agents such as wind and glaciers also significantly alter the land form and they are prevalent in Mt. Kailash region. The wind related erosion is evident in monument type rock carvings evident in Kailash region in the shape of human figures and other animal shapes. Glaciers are river of ice such as that in Figure-7 that moves at a very slow speed and acts like a giant bulldozer. Several glaciated valleys were evident around Mt. Kailash during our three expeditions. Himalaya and Tibet has the largest concentration of glaciers outside of two poles. Siachen glacier is the largest outside of Polar Regions. These glaciers are melting away at an accelerated pace due to rising temperature and increase in greenhouse gases as shown in Figure-8. This unfortunate event may present us with an opportunity to explore areas long buried under mountain of ice. The Kailash region is also seismologically very active as shown in Figure-9. The seismic event may have destroyed ancient structures over a period of time.

Figures-10 through 13 presents the geographical features and aerial/satellite imagery of Mt. Kailash region and that of Mt. Kailash.

Formation of Himalayas

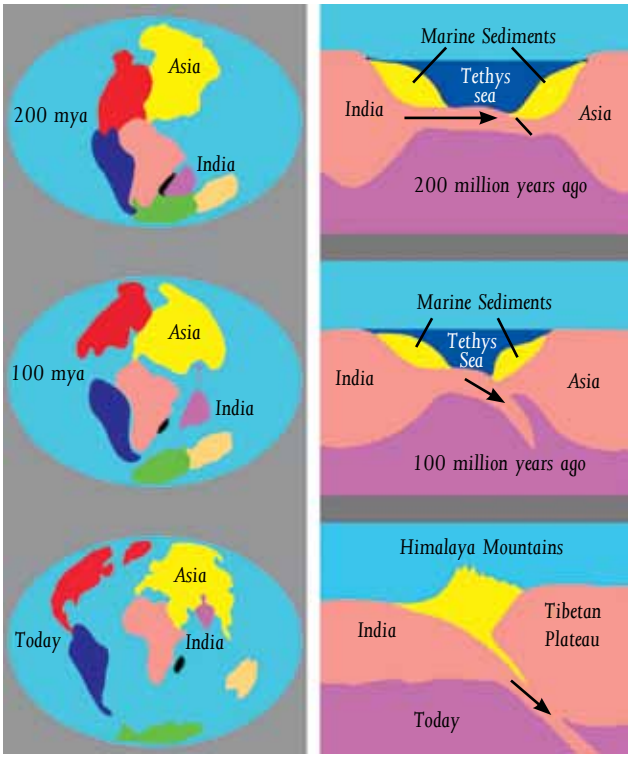

Fig.2: This figure gives an idea of breaking of main first continent (known as Pangaea) and how India with its NE movement collided with Eurasian landmass to create Himalayas.

Source: Pete Winn," Geology and Geography of Tibet and Western China", Earth Science Expeditions, November, 2002.

Collision of Indian & Eurasian Plate

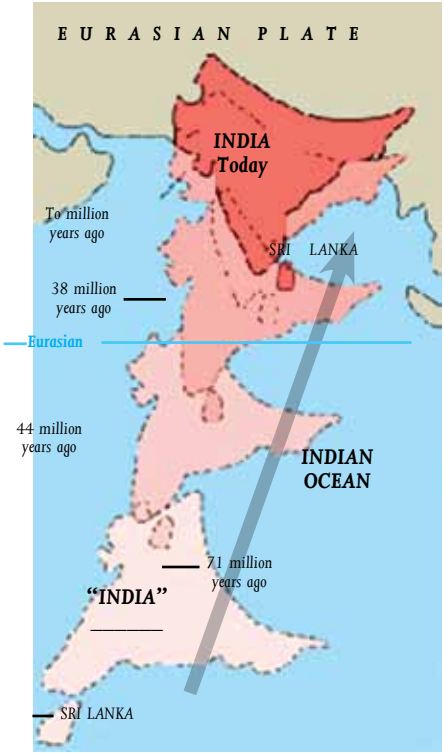

Fig.3: Over periods of 5-10 million years, the Indian landmass (plate) will continue to move at the same rate. In 10 million years India will plow into Tibet a further 180 km. This is about the width of Nepal. Because Nepal's boundaries marks the Himalayan peaks and on the plains of India whose convergence we are measuring, Nepal will technically cease to exist. But the mountain range we know as the Himalaya will keep on rising.

Geology surrounding Mount Kailash

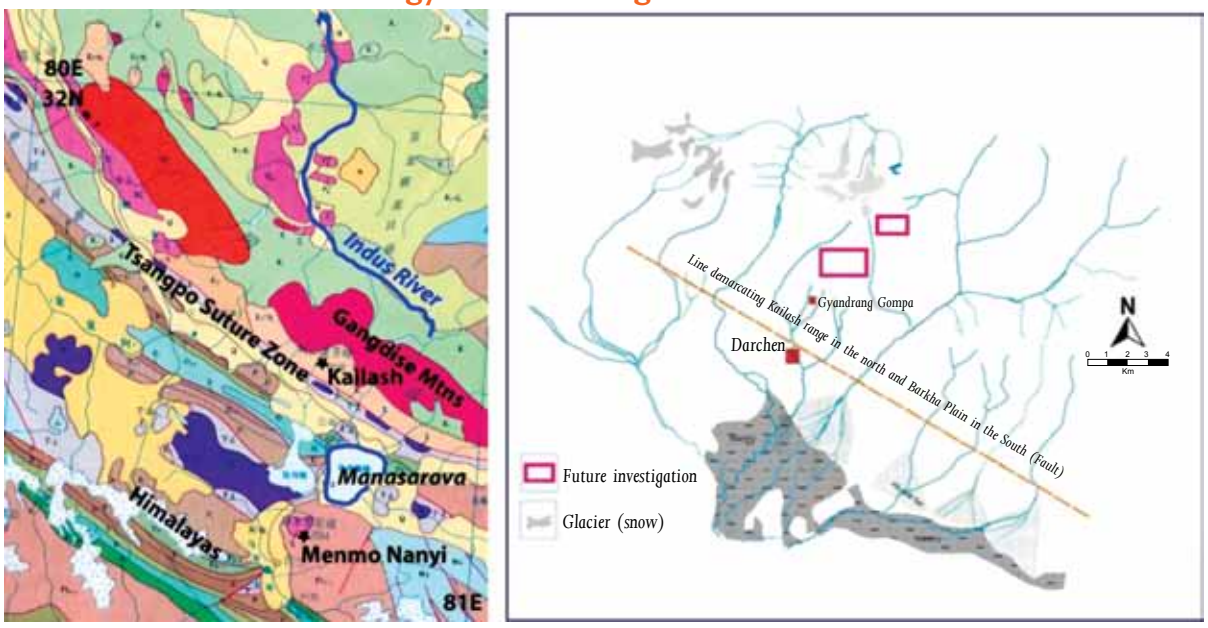

Fig.4: Map produced by the Chinese Ministry of Geology and Mineral Resources Original scale 1:1,500,000

- Tsangpo Suture Zone is contact between Indian subcontinent (Plate) and Eurasian Plate
- Brahmaputra River originates from Mansarovar Lake

Rock Formations

Fig.5: Mount Kailash composed of Meta sedimentary rocks with a massive intrusion of granite batholith. This looks very similar to Sierra Mountain in California.

- The Mt. Kailash and Indus headwaters area is characterized by extensively faulted and metamorphosed late Cretaceous (66MYA) to mid Cenozoic (24MYA) metasedimentary rocks which have been intruded by Cenozic granitic rocks. Faults are generally oriented NW-SE. Paleozoic (550 to 245 MYA) and Mesozoic (245 to 66 MYA) rocks generally occur south of the Tsangpo Suture in NW-SE elongated fault bounded blocks. Paleozoic (550 to 245 MYA) rocks represent offshore marine limestones deposited before subduction of the Tethys oceanic crust. Mesozoic (245 to 66 MYA) sediments were deposited on the southern margin of the Asia block during subduction of the Tethys oceanic crust and prior to the collision between the Indian and Asian continents. North of the Tsangpo Suture, a large sheet of Late Cretaceous (66MYA) to mid Cenozoic (24MYA) clastic sediments unconformably overlies these rocks. These sediments were derived from the volcanic highlands during the early stages of collision. This suture zone is well marked by numerous precious gem stones suggesting high temperature and pressure conditions in the region at that time.
- Cenozoic granitic rocks probably represent the final phase of fractionation of sub ducted continental sialic Indian continental crustal rocks which intruded in the Meta sedimentary rocks of Mt. Kailash region.

MYA - Million years ago

Present glaciers of world

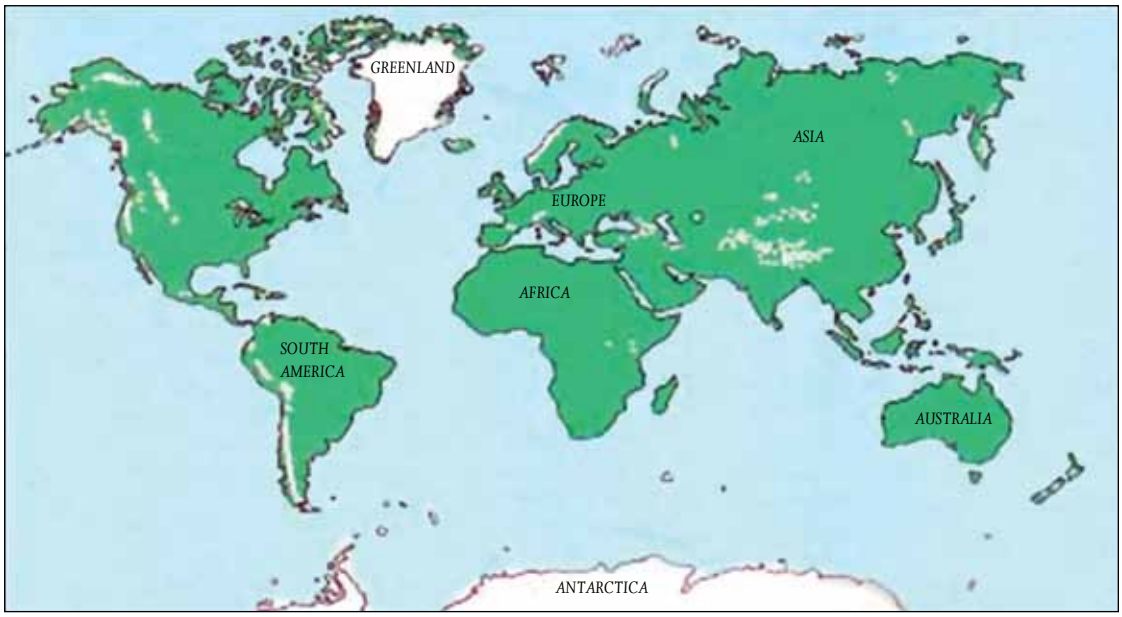

Fig.6: Siachen glacier is the largest outside of Polar Regions of the world.

White areas show ice sheets and other glaciers around the world. The white spots in the oceans are islands where glaciers are originating. Reproduced from National Geographic World (February 1977, no. 18, p.6) with permission.

Glacial history

Fig.7:

- Several glacial-interglacial climates in last 1 MYr. With each cycle of about 100 KYr.
- Antarctica accounts for 91% of ice and Greenland about 8%
- There are about 15000 glaciers in Himalaya that are shrinking fast and are losing 250 Km of ice each year.
- Nearly 40% of the humanity depends on the Himalaya glacial melt waters.

Many glacial lakes have been recorded in Tibet and Himalaya e.g. Lake Mansarovar and Rakshas lakes. Numerous major rivers e.g. Indus, Brahmaputra etc. have been originated from these lakes.

Temperature History of The Earth

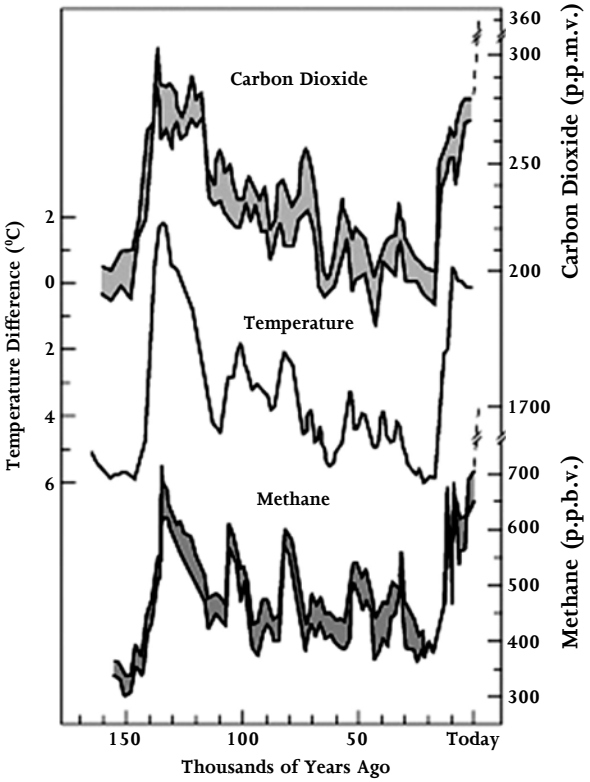

Fig.8: Receding Gangotri Glacier

- Evidences from 1842 to 1935 it receded 7m/yr. From 1935 to 1990 it receded 18m/yr.
- Last three decades in Himalaya were hottest in past 1000 yrs. and gangotri glacier receded at a rate of 30m/yr. in three decades!
- Recession of glaciers is exposing many rock formations in Tibet that were buried for thousands of years.

Earthquakes

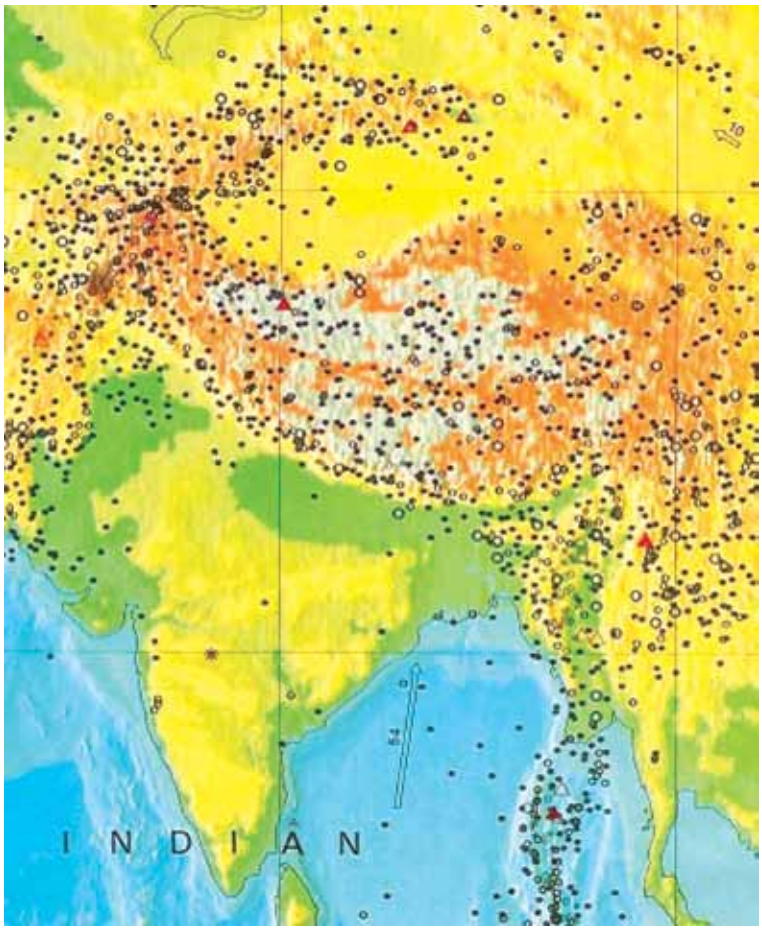

Fig.9: The Indian plate is too thick and its density is too low for it to be subducted beneath the Asian plate. The result is a collision, causing sea floor sediments to be pushed up about six miles, uplifting the Tibetan Plateau, a region the size of Alaska, to an average elevation of over 16,000 feet and causing many earthquakes. Higher magnitude earthquakes occur too often in this region.

Geography

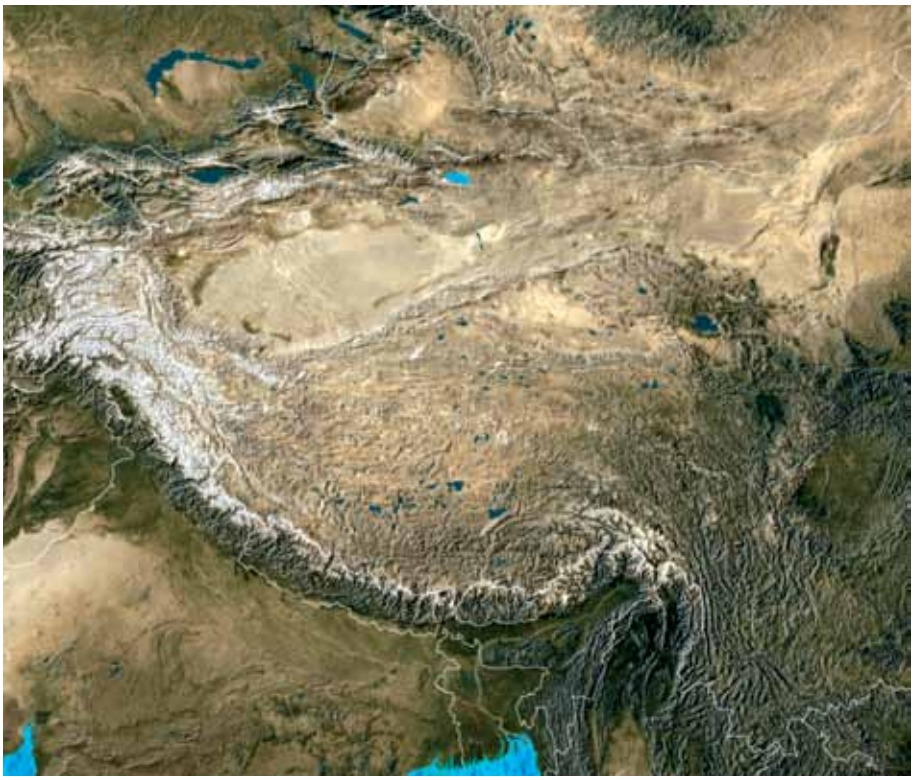

Fig.10: Figures 10 to 13 shows the physical and satellite photos of Himalayas. Himalayas form the NW-SE arcuate mountain system. To the north is Higher Tibetan Plateau with average 12000' to 15000' height. Tibetan region is known as the cold desert and the cold wind blowing from Tibet is well restrained by the lofty ranges of Himalayan Mountains entering the Indian landmass. The weather conditions are well controlled with Himalayan mountain range as barrier between Tibet and India.

Mansarovar Lake and Rakshas Tal

Fig.11: Satellite Image showing two major lakes Rakshas Tal (left) and Mansarovar (right) and Mount Kailash range to the North.

Satellite Imagery

Fig.12: Overhead view by satellite image

Kailash Area Satellite Imagery Details

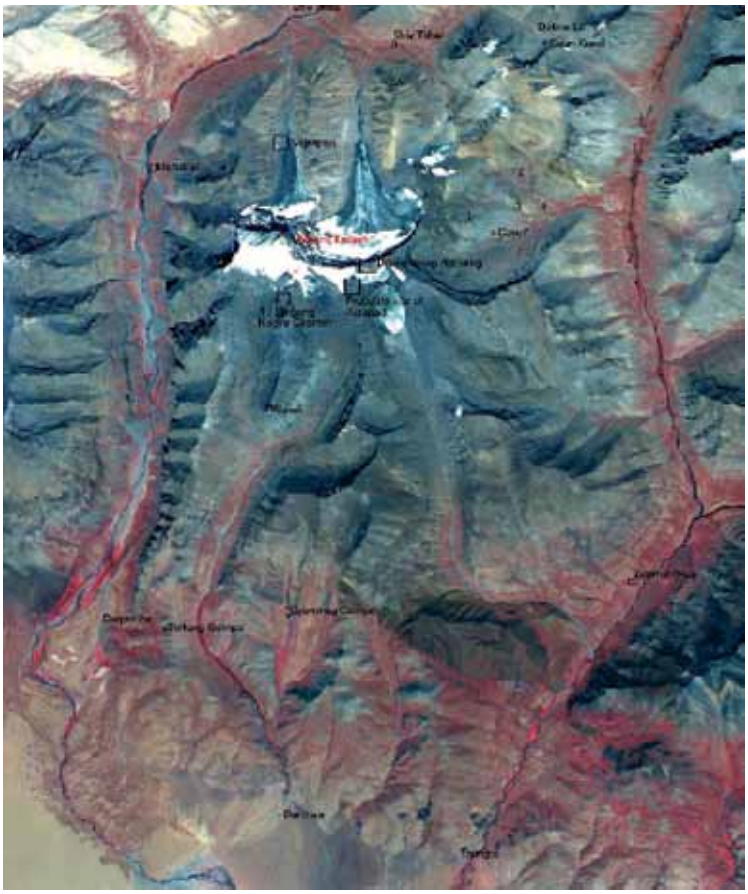

Fig.13: Shows the probable site of Ashtapad shrine with help of satellite image. Three field expeditions conducted by geologists, archaeologists, engineers, religious leaders, photographers etc. have suggested the probable site East of Mt. Kailash but yet to be proved with authenticity.

Map Showing Location of Mt. Kailash

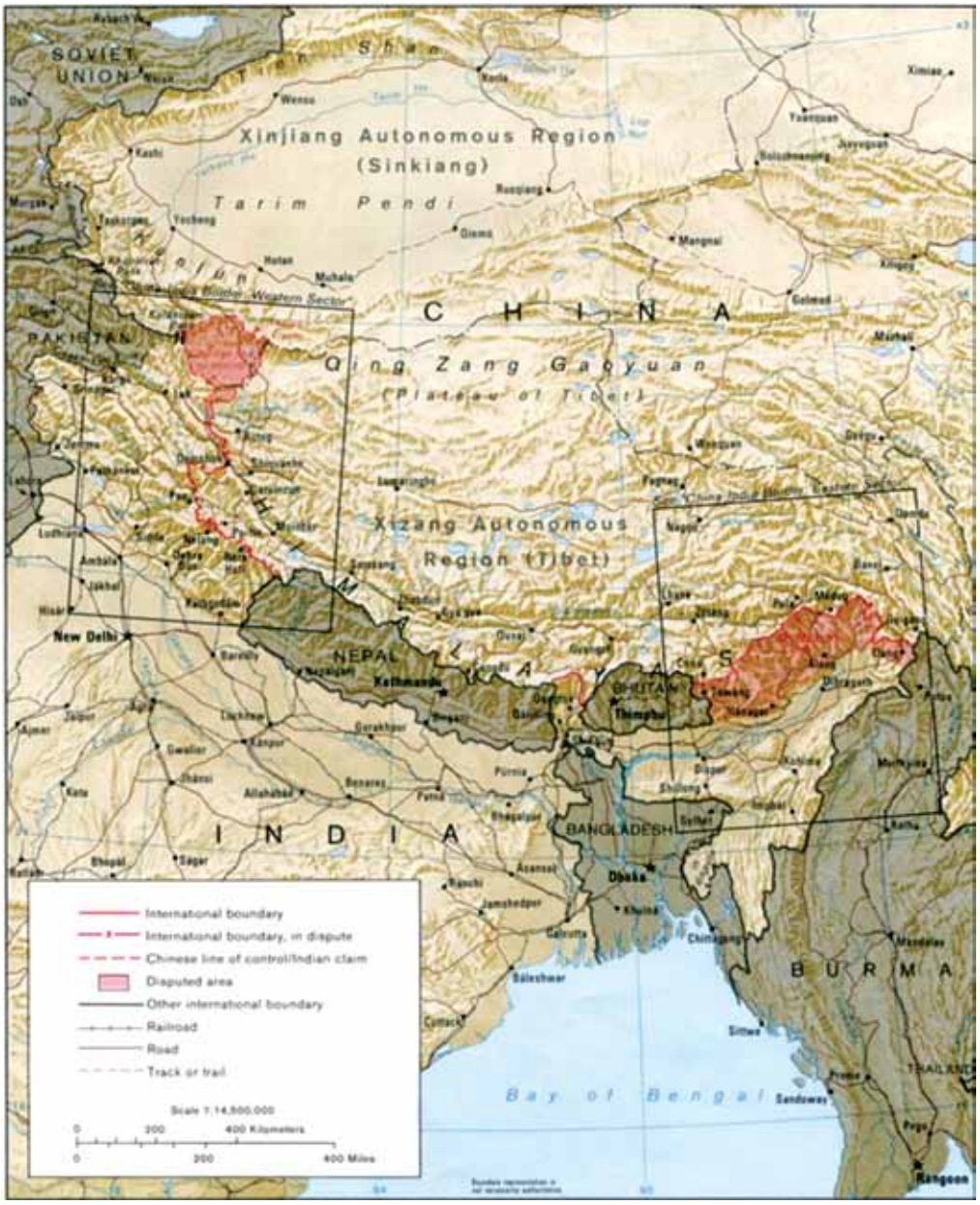

Fig.14: Shows the holy Mt. Kailash and holy Mansarovar which are located in the Tibet Himalaya.

16 Central Himalayan Geological Observations

Augusto Gansser
Summarized by Mayur Desai and Ajit Shah

The following document presents excerpts from publication by A. Gansser, titled "Geology of Himalayas", published by Inter-science Publications, 1964. The selected excerpts related to geology of Mt. Kailash region are presented in here.

Regional Setting

The regional settings of the Himalayas have some striking particularities, such as their outstanding height, the thrusts, rock composition and their isolated position. The Himalayas have no direct continuation either towards the west or to the east. The singular syntaxial bends on both extremes preclude a straight forward continuation of the Himalayan elements.

In the west, the Sulaiman Range is not a direct continuation of the Lower Himalayas, but is a fold system of younger sediments (Mesozoic and younger) which develops out of the Hazara Ranges in the west. Westwards, the Sulaiman belt is sharply limited by an ophiolitic tectonic line from the Flysch-type Baluchistan and Afghan sediments. This suture line may be a continuation, or most likely a branch, of the Indus suture line. The other branch seems to form the southern border of the Hindu-Kush Range, the western equivalent of the Karakorum.

It is much more difficult to follow the eastern continuation of the Himalayas due to lack of geological information. The little we know indicates that here too there is no direct continuation of the range. The southeastern Assam foothills (Naga Hills) differ from the corresponding Himalayan foothills. The crystalline rocks of the Mishmi Hills seem to belong to the Higher Himalayas, though some indications of inverted metamorphism do exist. The backbone of the western Burmese ranges, the peculiar Arakan Yoma, has no affinities with the Lower or Higher Himalayas. The Flysch type sediments, mostly of Cretaceous age, expose some ultra basic rocks aligned along the eastern border which is faulted and partly thrusted. Acertain similarity with the Indus Flysch belt seems evident, but no direct connection with this important north Himalayan element is known. We have noted that the latter disappears east of the Manasarovar Lake in the northern Kumaon Himalayas. The Arakan Yoma Ranges certainly is on eastern equivalent of the Sulaiman Range. Within the mountain ranges of Asia, the Himalayas display thrusting of such a magnitude that a crustal shortening of about 400 km is suggested. This is not the figure assumed by some authors for the crustal shortening in the Alps. This amount,

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Original Source - Central Himalaya : Geological observations of the Swiss Expedition, 1936

Ref. Vol. XII Ch. 86 F Pg. 5534-5555

however, does not include the shortening along the Indus suture line, where a considerable area (the exotic regions) must have disappeared into depth. Except for the northwards-directed thrust of the exotic Flysch masses towards the Trans-Himalayas southwards-directed tectonic elements dominate. This south vergency is at present underlined by the exceedingly elevated hinterland (the Tibetan Plateau) and the deeply depressed foreland - the Indo-Ganges and Brahmaputra plain. These features offer a striking contrast to the present configuration of the Alps. The picture was probably less accentuated during the major Himalayan orogeny. The final rise of the Tibetan plateau is coupled with the youngest, actually recent morphogenic rise of the Himalayas, and has as its counterpart the sinking of the Indian foreland.

In the eastern Himalayas, the foothills are steeper and the foreland basin has shrunk to only 30-50 km. It is not without interest to note that most of the larger Himalayan earthquakes are concentrated in the eastern Himalayas and their foreland. This fact is illustrated in Fig. 149 where some of the major earthquakes have been compiled. Practically all are of the shallow type, and their foci are believed to occur between 20 and 30 km in depth. This is somewhat less than the presumed depth of the Moho discontinuity, which, based on results are admittedly vague, varies from 35 km in the western Himalayas to over 40 km in the eastern part of the range. This amount is small if compared with the great crustal depression of the southern Alps,amounting to 70 km, which is probably so far the largest known crustal thickness. The fact that the Himalayas are not a geo-synclinal type mountain range except for the zone of the Indus suture, may be the reason for the relatively shallow crust below this high pile or mostly crystalline thrusts. Deeper depressions may be eventually found related to the Indus suture line.

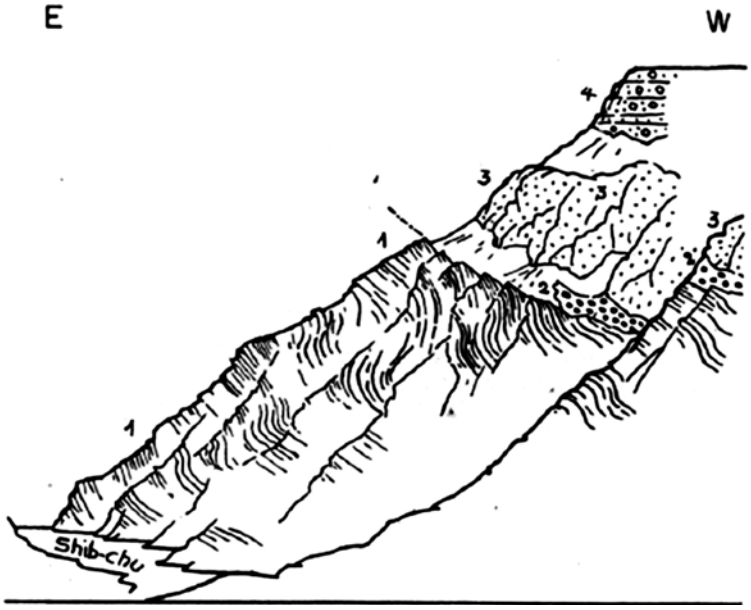

Fig.92: Transgression of the Jungbwa peridotiles directly on the Cretaccous Flysch without exotic blocks. Lower Shib-Chu Corge. S Tibet; after A. GANSSER (1939)

1. *Upper Cretaccous Flysch*
2. *Ophicalcites*
3. *Jungbwa peridotits*
4. *Pleistocene gravel terraces*

In the whole Himalayas, upwards movements are still very active. The morphogenic phase is clearly reflected in the present history of the range. The main elevation of the Himalayas was

an event witnessed by the earliest men. We may here recall the interesting idea ventured by B. SAHNI that the earliest human migrations were facilitated by a barrier or less forbidding height and steepness than the impressive Himalayas of today.

Rakshas anticlinorium

A wide anticlinorium of mostly Mesozoic and older sediments outcrops between the northern front of the exotic rocks and the wide alluvial depression following south of the foot of the Kailash Range, a part of the southern most chain of the Trans-Himalayas.

In the region of Jungbwa, just below the north wards-rising Flysch thrust, are some outcrops of black shales, identical to the black shales which form the base of the southern exotic front south of Arnlang-La and which have been regarded as an enlarged section of the Spitishales. They form the south flank of the large Rakshas anticlinorium. The next deeper horizons are greenish phyllitic clay slates, and has if it were not for the similar limestones contain horizons crowded with thick-shelled megalodons (Ph. 24). It is possible that some of the limestones represent the Kioto limestones of Rhaetic to uppermost Triassic age and even Trias in a somewhat different facies (Fig. 93). No similarity with a fossiliferous Tethys Trias was noted and much less any indication of resemblance with the exotic Trias facies. In the Sutlej Gorge, 100 km to the WNW, the facies of the calcareous section is already different, with intercalations of conspicuous black slates (Fig. 94).

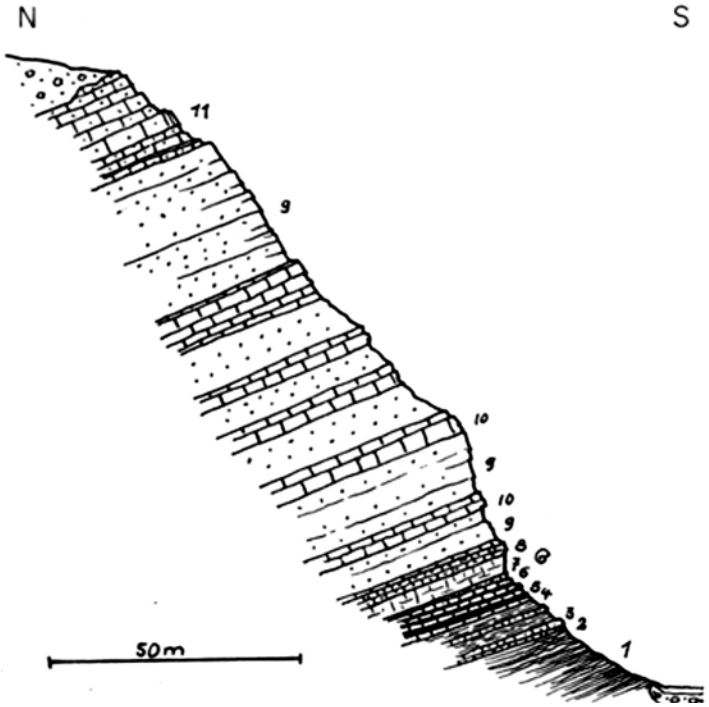

Fig.93: The Chilamkukur series in the Sutlej Gorge at Chilamkurkur. Rakshas anticlinorium. S Tibet;after A. GANSSER (1939)

1. *Black slates*
2. *Grey silty slates*
3. *Brown sandstones*
4. *Dark banded limestone*
5. *Red slates alternating with 4*
6. *Reddish sandy limestones*
7. *Limestones with Megalodon-like shells (Ph.24)*
8. *Quartzitic sandstones*
9. *Yellow-brown sandstones*
10. *Dark grey limestones*
11. *Thin-bedded and banded sandy limesones*

The core of the huge Rakshas anticlinorium is formed by yellowish and greenish, more or less calcareous and chloritic, sericiteschists, surprisingly recalling the Cambrian Garbyang formation. They form the lowest outcrops of the Rakshas anticlinorium, which seems to plunge slightly in a western direction and extends eastwards towards the Manasarovar Lake. Its eastern continuation is unknown, except that it may rise and be connected to a northwards spur of the large crystalline dome of the 7700 m high Gurla Mandhata.

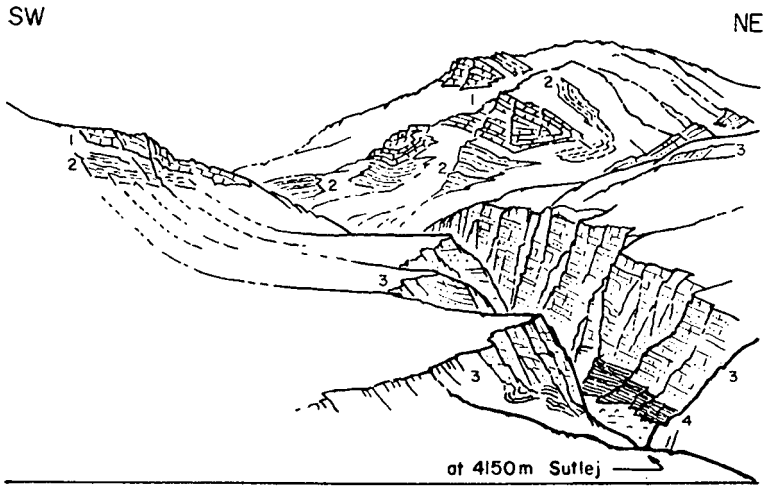

Fig.94: The Sutlej river cutting though the Rakshas anticlinorium. S Tibet; after A. GANSSER (1939)

1. *Upper Chilamkurkur series (calcareous)*
2. *Lower Chilamkurkur series (argillaceous)*
3. *Sandy calcareous schists*
4. *Black slates*

Crystalline dome of the Gurla Mandhata

Southeast of the famous lakes Rakshas and Manasarovar the wide Tibetan rolling hills are dominated by a huge dome-like uplift-the 7700 m high Gurla Mandhata. The morphological aspects suggest a very young uplift. The well preserved domal form and the sharply eroded deep gorges as well as its excessive height support this suggestion (Fig. 95 and Ph. 25).

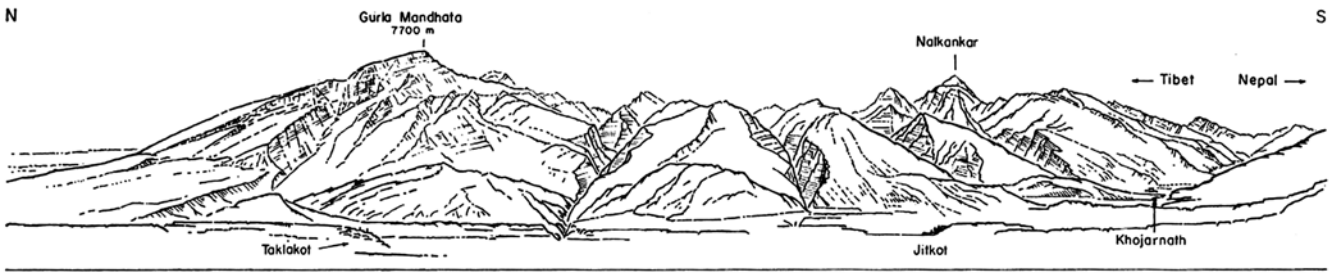

Fig.95: The gneiss dome of Gurla Mandhata. S Tibet; after A. GANSSER.
Core of gneisses, covered by schists transgressed by titled traces of the Taklakot region, uppermost Karnali valley.

The outer layers are formed by epimetamorphic phyllites, while the inner core exposes muscovite-biotite gneisses, not unlike the Darjeeling - type gneiss (Helm and Gansser, 1939). Sven Hedin collected crystalline rock~ from the northern slopes of Gurla Mandhata described by Hennig (1915). He mentions banded to lenticular two mica alkali-feldspar gneisses. The western border of Gurla Mandhata is bordered by the young gravel terraces of Taklakot in the

uppermost Karnali valley (Ph. 26). They expose several well-outlined levels with increasing tilts towards the dome, well visible on its western plunge. They reflect the young uplift of this area. Mesozoic Tethys sediments strike eastwards under these terraces. On the north side, the belt of the exotic blocks of Amlang-La trends towards the north-plunging end of the Gurla Mandhata dome, but the direct relations are not known, since here again up tilted terraces mask the contact. The Gurla dome seems a southern, and higher, equivalent of the Rakshas uplift. Whether the two are directly connected across a saddle in the north is not known. Both seem to be autochthonous and could, as we have already mentioned be compared to the Tso Morari uplift in the Rupshu area, described by Berthelsen (1953).

Kailash Range (Southern Trans-Himalayas)

While travelling from the Tethys Himalayas of Kumaon northwards further into Tibet, we have so far not met the northern border of the Himalayas, but have become involved in the more intriguing problems of the huge exotic thrust masses. Only on reaching the Kailash Range in the Trans-Himalayas is it possible to find some conclusive evidence for this northern limit.

Kailash Flysch

After the last gently north-dipping outcrops of the deeper Rakshas phyllites one crosses a sandy alluvial plain of over 20 Km before reaching the foothills of the Kailash Range. This plain hides one of the geologically most important stretches of the whole Himalayas. South of the Kailash the foothills consist of a highly complex and steeply south-dipping Flysch zone (the Kailash Flysch) with intercalated ophiolites and some exotic blocks. To the west, this Flysch zone is cut out, and the northwards-outcropping, Kailash conglomerates reach the alluvial plain. Eastwards the Flysch continues, but its extension is unknown. The Kailash Flysch represents the last remnant of the Himalayas, thrust steeply northwards over the autochthonous Kailash conglomerates which transgress over the Kailash granite (Sect. 3, PI. III).

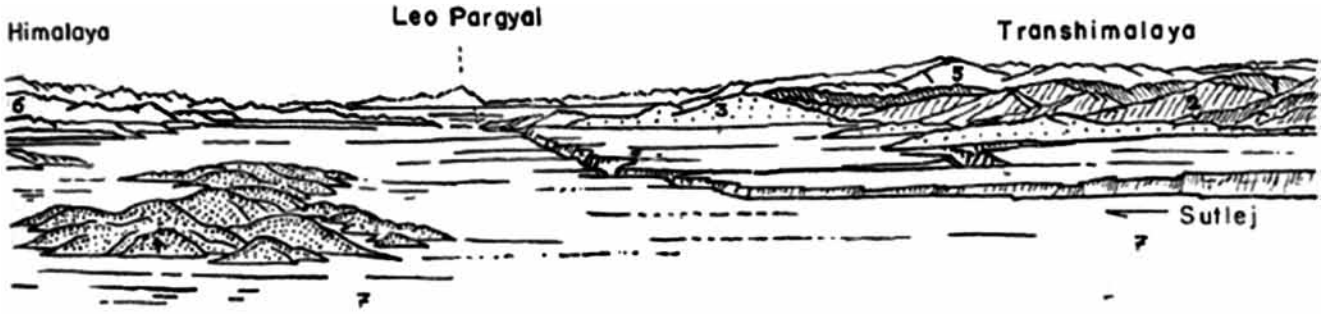

Fig.96: General view of the Upper Sutlej Basin, view towards NW. S Tibet; after A. GANSSER (1939)

1. *Lower Chilamkurkur series*
2. *Upper Chilamkurkur series*
3. *Flysch zone*
4. *Jungbwa peridotites*
5. *Zone SW of Gartok, probably crystalline*
6. *Sediments of Tethys Himalayas*
7. *Sediments of Tethys Himalayas*

It is evident that we have here one of the key sections of the Himalayas-its well-exposed northern limit. But it also happens to be a very holy place-the Kailash Mountain is sacred to Asiatic religions. Geological investigations, at least during 1936, could only be carried out "on the sly". What I describe here are the results of a rapid reconnaissance work, which gives the general outline but leaves much remaining to be done for a more detailed picture.

The first (southernmost) outcrops of the Flysch zone consist of a most complicated scupper zone of sericitic sandy slates, red sandstones, slates and red radiolarian chart. They are intruded by massive enstatite-bearing serpentine which is associated with lenses of yellowish to white dolomitic limestones. These limestones are strikingly similar to certain exotic blocks, and the serpentine, which still shows the characteristic mesh texture of altered olivine, together with enstatite, is identical to the Jungbwa peridotites, which are younger than the Flysch (Fig. 97). The whole section dips steeply to the south. Going north we first meet with a zone of vertical limestones, and then with another south-dipping series, several thousand meters thick, of intensely folded grey phyllites, calcareous sandy schists and slates. On their southern border they contain a layer of red calcareous conglomerates which seems to be repeated towards the north together with some pyroclastic reddish calcareous sandstone. This whole mass of slightly metamorphic Flysch is thrust along a well-exposed and 30-40° south-dipping sharp tectonic contact over the thick and horizontally bedded Kailash conglomerate (Ph. 29, 30). There is hardly any doubt that this Flysch section with its ultra basic rocks and included exotic limestones corresponds to the exotic thrust mass of the Kiogars, Amang-La and Jungbwa. The thrust is clearly north directed, as we can recognize at the upturned Kailash conglomerates (Ph. 29, 30). This thrust divides the Himalayas from the Trans-Himalayas, the all ochthonous from the autochthonous, along a sharp contact (Sect. 3,PI. III). The general strike of the Flysch mass is practically E-W where as the Kailash Range and thrustline direction strike WNW-ESE. This means that the various units of the Flysch zone run obliquely against the thrust line. We noticed a quite similar discrepancy at the south front of the exotic thrust mass, which also strikes E-W and obliquely to the strike of the Tethys Himalayas. This coincidence is interesting, but could be merely accidental, since the two fronts are over 100 km apart, and only a very short section of the northern front has as yet been investigated.

Fig.97: The southern Kailash Flysch zone. Darchen, Kailash region. S Tibet; after A. GANSSER (1939)

1. *Serpentinized peridotites*
2. *Ehite dolomitic limestones (exotics)*
3. *Red sandy slates and cherts*
4. *Sandy sericitic shares*
5. *Well bedded limestones*
6. *Gravel terraces*

Kailash Conglomerates

North of the thrust we enter a completely different region, characterized by huge fantastically shaped conglomerate mountains sitting on granites, of which the 6700 m high Kailash itself is a surprisingly imposing and beautiful example (Ph. 31,33). The horizontally bedded conglomerates reach from 4700 m to the top of the Kailash, i.e. there are some 2000 m visible. Their actual base north of the thrust must be at least 1000 m deeper, and since the Kailash is only an erosional remnant, the top of the conglomerates must have been even higher. We

thus arrive at an astounding thickness of over 4000 m of undisturbed near-horizontal coarse detrital deposits. Sandstones are rare and increase slightly in a southern direction.

Fig.98 Transgression of the Kailash conglomerates on Kailash granite. NW Kailash, S Tibet; after A. GANSSER (1939)

1. *Kailash hornblende-biotite granite*
2. *Basal conglomerate with granite boulders up to 5m*
3. *Fine conglomerate rich in granite pebbles*
4. *Coarse conglomerate with predominantly volcanic pebbles and boulders*
5. *Main conglomerate with volcanic pebbles*

The conglomerates are thick-bedded and near the Kailash some massive horizons can be 500 m thick (Fig. 98, 99). They transgress over an uneven surface of the Kailash granite with a basal boulder bed consisting of rounded granite boulders up to 5 cubic meters. They are embedded in a matrix of smaller granite pebbles and coarse arkosic sand grains. Upwards their size decreases and gradually well-rounded pebbles and boulders of colorful acid volcanics appear. Again a coarse conglomerate layer follows, consisting of 100 m of large boulders (up to 1 cubic m) of acid volcanics, quartzites and some red cherts. Higher up, the pebbles are smaller, usually less than headsize, with a predominance of well-rounded volcanic rocks. These volcanics represent liparites, dacites, and esites, granophyres as well as liparitic and dacitic tuffs. Granitic pebbles are very rare, metamorphic components and carbonate rocks seem to be missing completely, except for on 2 cm pebble of a yellow limestone. The pebbles diminish in size from north to south as well as from the bottom to the top. The matrix is usually coarse-grained, sandy and siliceous, but not calcareous, a fact which distinguishes the Kailash conglomerate amongst others from the Flysch conglomerates. From the matrix subordinates and stones can develop mostly greenish grey and arkosic in composition.

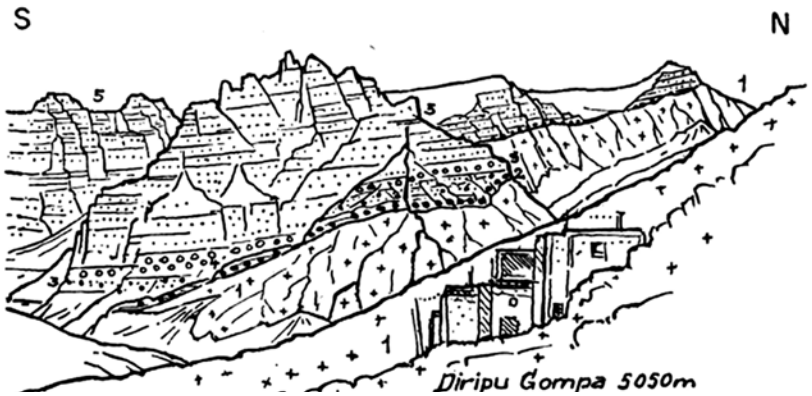

Fig.99: The south plunging Kailash granite with the transgression of Kailash conglomerates, N of Kailash, STibet; after A. GANSSER (1939) for legend see fig.98

In the north, where the conglomerates overlap the Kailash granite, the regional dip is about 10°to the south. Southwards this dip diminishes to about 2-3° (Fig. 99). The almost horizontal layers can be followed southwards until the thrust of the Himalayan Flysch is reached. Here one is struck by the sudden upturning of the horizontal conglomerate beds into an over turned position. This fact is very well visible in the field (Ph. 29, 30). Approaching the thrust, some of the smaller intercalated sandstones gradually show intense disharmonic folding, while the conglomerates are still undisturbed (Fig. 100). Only very near the thrust is some secondary folding visible within the conglomerate layers.

The distribution and size of the conglomerates and sandstones clearly indicate that the conglomerates have been deposited from north to the south, and originated north of the Kailash granite. The acid volcanic components are a rock type unknown in the south, but are similar to some volcanic rocks collected by Sven Hedin north of the Trans-Himalayas and described by Hennig (1916). Nothing is known of the lateral extension of the Kailash conglomerates except that they seem to continue eastwards along the Trans-Himalayan foothills, while their westwards extension seems limited.

The age of the conglomerates is still questionable. They are certainly younger than the Kailash granite, and the latter, as we will see, could be correlated with the Cretaceous Kyi-Chu granite of Lhasa (Hayden, 1907). They are older than the thrust of the Himalayan Flysch and most likely should be placed between the Eocene and the Miocene.

Kailash Granite

The Kailash conglomerate transgresses with a normal stratigraphical contact over the Kailash granite, which rises northwards from underneath the conglomerate forms a wild granite landscape north of the Kailash Mountain. The granite, with its sharp peaks, has a strong irregular cleavage, and produces coarse scree. It is generally rather fresh up to the transgression of the conglomerates. In the Kailash region the granite is completely massive, but further to the north it seems to become somewhat gneissified. The main rock type is hornblende - biotite granite, medium-grained with alkali feldspars not exceeding 2 cm. These are mostly microcline while the plagioclase is oligoclase to and esine. Most interesting are the hornblendes, with sieve-like relics of augite (Ph. 32). The latter have a uniform extinction and seem to have been the primary constituent. Sphene is frequently associated with the hornblende. These facts are important for the correlation of the granites. They frequently contain more basic inclusions of a hornblende - dioritic composition. Here again the hornblende is characterized by augite inclusions. A few tourmaline aplites cut through the granite, but other dykes are absent or rare.

Practically nothing is known so far about the extension of the Kailash granite. From the few samples collected by Sven Hedin north of the Kailash region, the Kailash granite seems to change into liparite and dacites. The latter are very wide spread and intrude Middle Cretaceous Orbitolina limestones (Hennig, 1916). Westwards, along the foothills of the Trans-Himalayas, granite has been recorded again by Sven Hedin at Gartok-determined by Hennig as a biotite - hornblende granite which seems quite similar to the Kailash granite. There too, dacitic lavas seem to occur further to the north. Another granite occurrence similar to the Kailash granite

has been reported by HAYDEN. It outcrops along the Kyi-Chu valley, from the Tsangpo to beyond Lhasa. This granite is also a hornblende-biotite granite, but differs from the Kailash granite in the amount of albite and a certain carbonate content. It seems to be intrusive into Jurassic (and Cretaceous) calc-schists and is thus of late Cretaceous or younger age (HAYDEN, 1907). HAYDEN stresses the difference between the hornblende-bearing Kyi-Chu granite and the mostly hornblende - free normal Himalayan granites (see later).

From the Ladakh Range at Leh, Wyss (inVISSER, 1940) describes several biotite-hornblende granites not like the Kailash granites and suggests a pre-Senonian age. A possible connection with the Ladakh granites via the Gartok granites is possible, but too many gaps still exist to permit more than purely speculative correlation.

The regional problems of the northern Kumaon Himalayas up to the Kailash Range will be discussed later. So far only the main facts of this remote and still little-accessible region have been given. Emphasis had to be placed on this northern area, since further to the east along the northern Himalayas, our information remains exceedingly scanty or is missing altogether.

Comparing these lithological sections with Lower Himalayan sediments further to the west as well as with the fossiliferous sections of the Tibetan or Tethys Himalayas, one doubts the ages assigned by both HAGEN and BORDET. Why should a Permian age be suggested for a conglomerate resembling the Alpine Permian Verrucano 6000 km away, while elsewhere in the Himalayas the Permian occurs in a calcareous shaly Product us facies? Strikingly Verrucano - like sediments have been found by the writer in southern Central Bhutan in an association recalling quartzitic Dalings, and probably of late Precambrian to Cambrian age. BORDET believes his Collenia - bearing dolomites to be of Devonian age. As we have already seen in the Kumaon Himalayas they are Cambrian or older, an age proven for very similar Collenia - bearing dolomites in the Middle East Elburz Range, where they occur in typical siliceous dolomites far below Middle Cambrian faunas.

Fig.100: Disharmonic folds in sandstone intercalation at the base of the main Kailash conglomerates. Folds increase approaching the main thrust, E. Kailash, S Tibet; after A. GANSSER (1939)

1. main Kailash conglomerate 2. shaly sandstones 3. scree

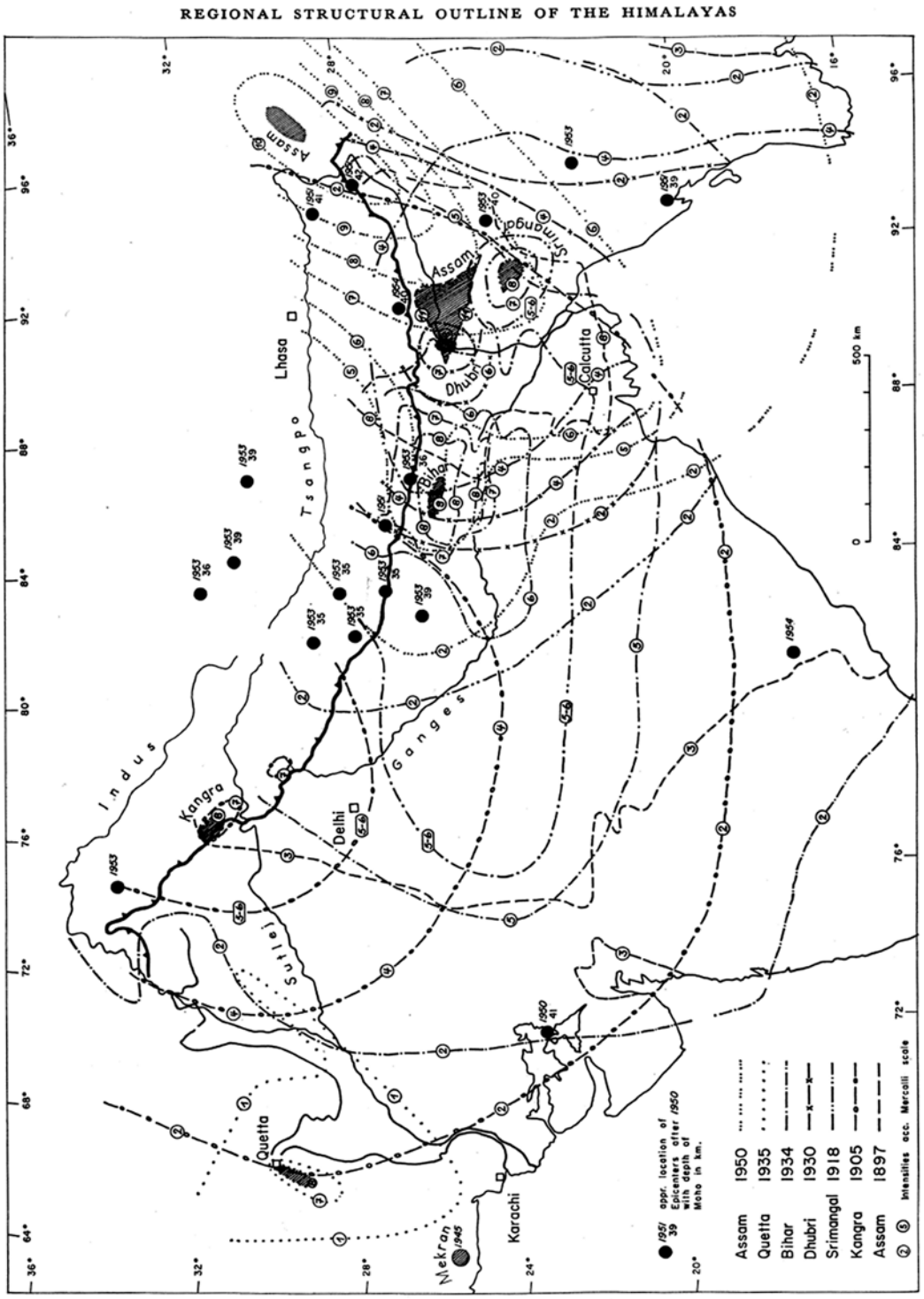

Fig.149: Major earthquakes of the Himalayas and adjoining areas, compiled from all available sources

17 Tectonic design and evolution of the Himalaya

K. S. Valdiya
Summarized by Ajit Shah

Seism-tectonic activities in this area are constantly observed. Himalaya and Tibet constitute a part of this Alpine Himalayan orogenic belt where a constant push by Indian Sub continental mass is observed in the NNE direction, on the collision course with the Eurasian continental mass from the North in the SSW direction. These forces eventually collided at the Indus Suture Zone forming the rift valley where the great Indus and Brahmaputra Rivers and their tributaries flow and in this process uplifted the great sedimentary sequence to form the Tibetan Plateau, known as the 'Roof of the World'. This phenomenon is still active and the height of the Himalaya is rising about 3 to 4 cm/year.

During this process high tectonic stresses are evolved and the total effect is often observed in the numerous occurrences of earthquakes in this region.

Valdiya (1984) in his book on aspects of Tectonics; Focus on South Central Asia (Published by Tata Mc Graw Hill, New Delhi), described the large number of tear faults and fractures as a part

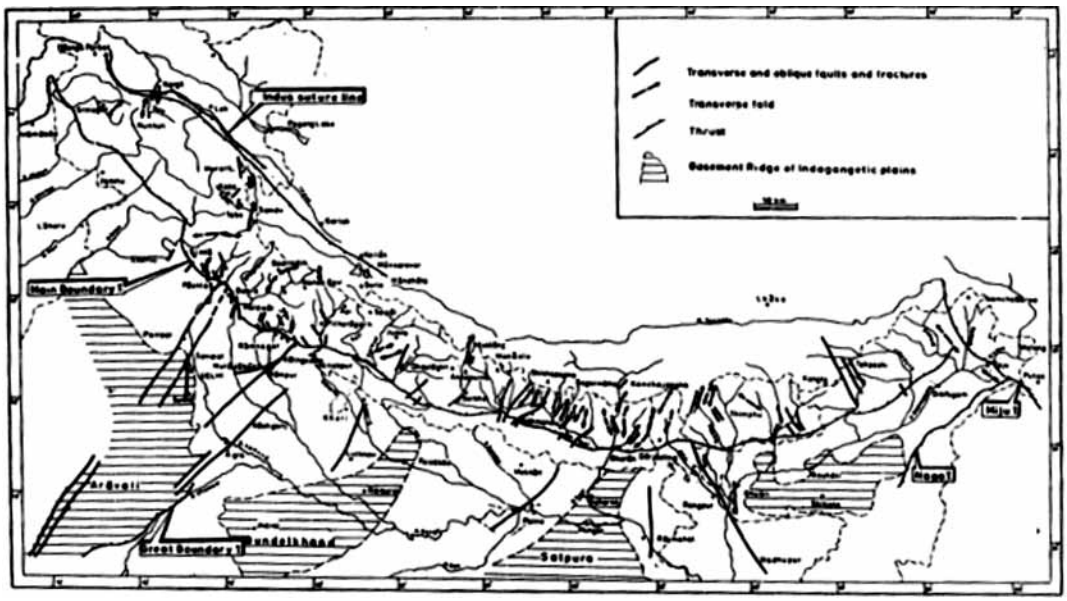

Fig.4.13: Transverse conjugate sets of tear faults of the Himalayan belt and of the basement of the Ganga Basin in the foreland. (Valdiya, 1976)

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Original Source - Aspects of Tectonics, Pg. 50-57, 165-168, Tata McGraw - Hill Pub. Co. 1984

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of conjugate sets trending nearly perpendicular to the orographic strike (EW) and have been recognized throughout the expanse of the Himalaya. The dominant trend is NNE – SSW (Fig. 4.13, p.51). The best example of strike – slip fault in the Himalayan heights is the Karakoram fault in North Ladakh.

In the Tibetan Plateau and adjoining Chinese Mongolian highlands, Molnar and Tapponier (1975) have recognized many EW trending hundreds of Kilometers long strike-slip faults. All these faults are found seismically active attesting to the movements taking place in present times. The high seismicity is attributed to these strike-slip movements along many EW trending faults.

The quantitative seismicity map of the Himalaya (Kaila et al;1972, Valdiya P.57) shows transverse trends of higher seismicity. The high stress drop indicates prevalence of high stresses in Tibet.

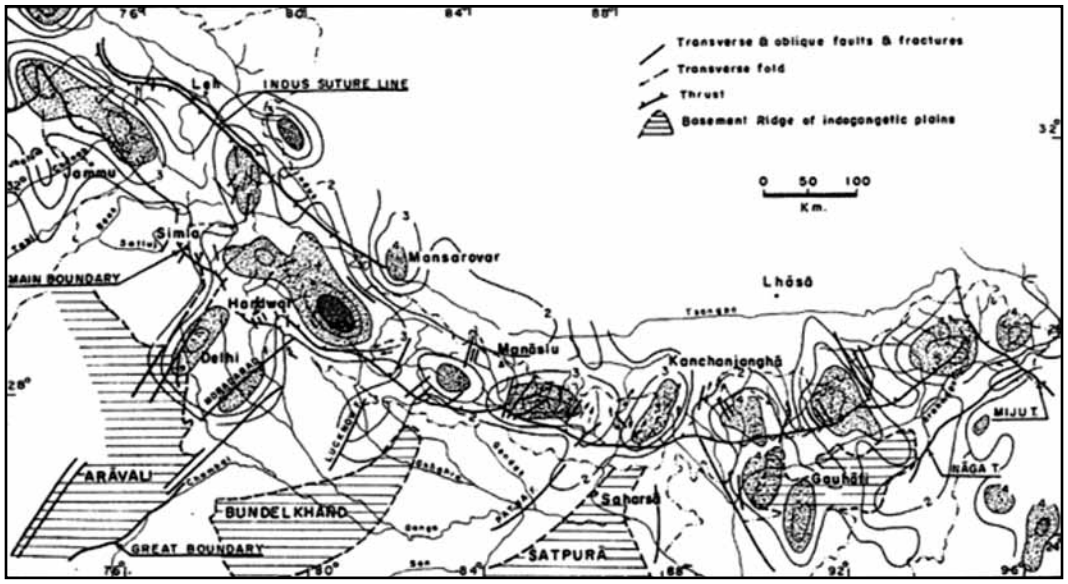

Fig.4.17: Quantitative seismicity map of the Himalaya showing transversal trends. Note that Kumaun is seismically the most active part of the Himalayan arc (after Valdiya, 1976, and Kaila and Narain 1976).

Seismicity of Southern Tibet and The Himalayan belts

Earthquake hypocentres are very shallow and irregularly diffused in distribution over the southern Tibetan plateau (crustal thickness is of the order of 60-80 km). The ITSZ is likewise seismically very inactive, being affected but rarely by earthquakes of magnitudes less than 2. In contrast, the frontal belt of the Himalaya is more active (Fig.8.26). The MBT zone is particularly active and the Ganga Basin is affected more frequently by moderate to high magnitude shocks The example, the earthquake of Madhubani (Bihar) in 1934, Dhubrhi (Assam) in 1930, upper Brahmputra valley (Assam) in 1950, and so on. One of the most disastrous earthquakes, that of Kangra in 1904, was located in the MBT zone. Likewise, the earthquakes are very frequent and of larger magnitude in the zone of the Chaman Fault system in the west and the Patkai-Naga-Arakan subduction zone in the east. There is greatest concentration of seismic activity in the Hindukush belt in the northwest and in the orographic junction in the northeastern corner.

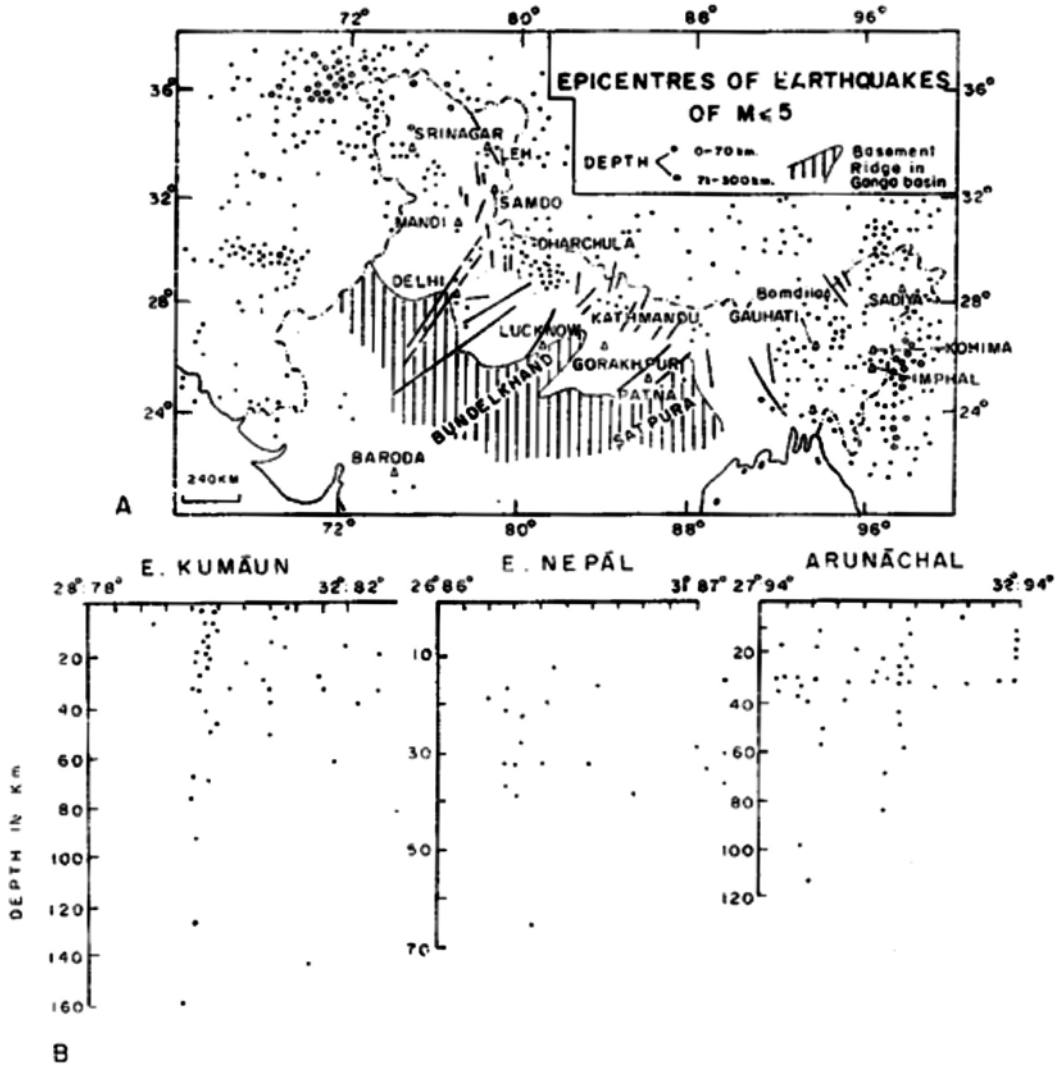

Fig.8.26: (a) *Distribution of earthquakes of magnitude 5 or above (upto 1975). (Based on Chaudhury et al., 1974 and Valdiya, 1976), The lines represent faults, and the lined parts denote prongs of the Indian Shield prodding the Himalaya.*

(b) *Radial cross-sections across the Himalayan arc (ISS data, 1964-69). There is clear vertical linearity in the hypocenral distribution in all the three sectors, (After Kaila and Narain, 1976)*

In the Hindukush the hypocentres are distributed in a V-shaped pattern indicating, in the opinion of the author, differential vertical movement along faults or shear zones. It could also be taken to imply convergence of two steeply dipping lithospheric blocks down to a depth of 200 km. However, the fault mechanism indicates a dominant thrust movement in the western sector. Likewise, in the Indo-Burman mountain arc in the east the fault-plane solution of earthquake data (1881-1979) suggests dominant eastward under thrusting of the Indian plate, together with a subordinate component of strike-slip and normal fault movements (Rastogi *et al.*, 1973; Chouhan and Srivastava, 1975; Verma *et al.*, 1976; Chaudhury and Srivastava, 1976).

The epicentres generally follow the trend of the mountain; and in the outer belt of the Himalayan arc though the frequency is less, their magnitude is higher and the movement mainly dip-slip

(Chandra, 1978). According to an analysis of the fault-plane solutions, there is dominance of movement on thrust planes (Fig. 8.27). Analysis of the data pertaining to the earthquakes (M 5.2-6.3) of Nepal shows the thrust faulting is accompanied by small component of strike-slip movement. It is also discovered that high stresses prevail in this sector (Gupta and Singh, 1979) with pressures directed perpendicular to the orographic trend, implying northward under thrusting along the MFT and MCT (Fitch, 1970; Srivastava, 1973; Chaudhury *et al.*, 1976; Molnar *et al.*, 1977; Verma *et al.*, 1976; Chandra, 1978).

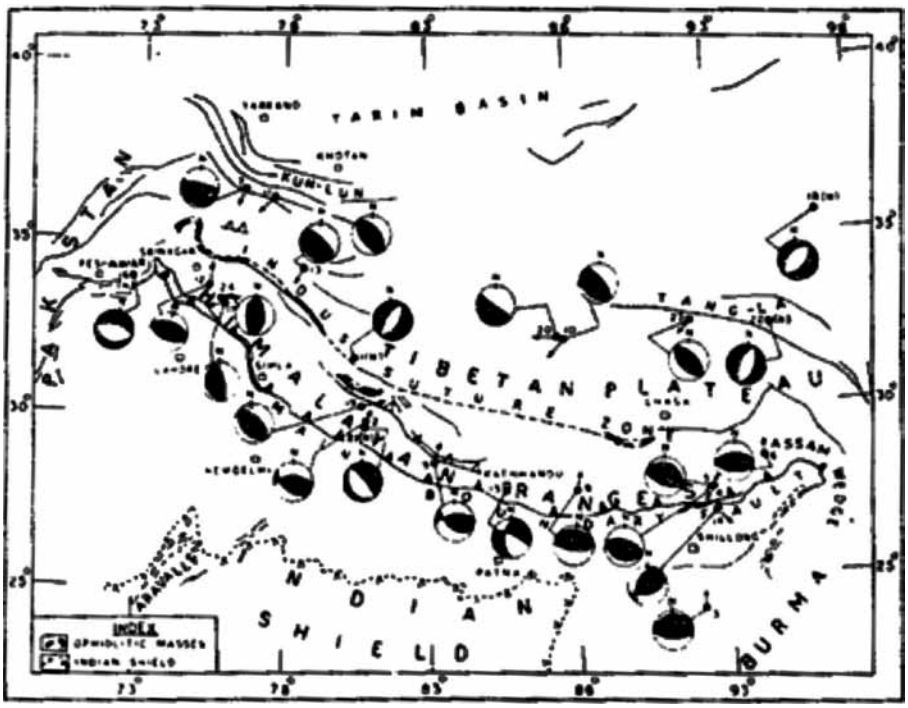

Fig.8.27: The fault-plane mechanisms suggest predominant thrust movements presumably along the MBT and less commonly along the MCT. (After Verma etal., 1977).

The analysis of seismic data also indicates strike-slip movement on both MBT and the many transverse faults in the outer Lesser Himalaya (Kaila and Narain, 1976; Valdiya, 1981). It thus appears that both strike-slip and dip-slip movements are taking place along the Himalayan thrusts. In addition, the strike-slip movements are taking place on transverse faults in the Himalayan region and along the E–W trending trans current faults in the Tibetan plateau and adjoining highlands (Molnar and Tapponier, 1975). These movements represent accommodation of the crust consequent upon northerly drift of the Indian plateau. The current seismicity is an eloquent expression of the continued dynamism of the Indian plate.

18 Geological investigation of rock sculptures around Mount Kailash

Navin Juyal and P.S. Thakker

Introduction

Kailash and Mansarovar have also been dubbed the fountainhead of the world and were recognized by early pilgrims as the source from which the four major rivers viz. the Indus, Brahmaputra, Sutlej and Karnali originate. Origin of these rivers according to geologists pre-dates the evolution of the mighty Himalaya. Kailash Mountain is the high point of the Tibetan table land which is separated from the main Himalayan Range (lies ~ 100 km south) by a wide low lying terrain called the Barkha plain.

In strict geological jargon, Mount Kailash is the world's highest deposit of tertiary conglomerate. Conglomerates are the naturally cemented boulders and in the Kailash area they were deposited probably during the Eocene to Miocene (between 4.5-5 million years ago). Mount Kailash is surrounded by well defined broad 'U' shaped valleys. These valleys radiate in all four directions (viz. East, West, North and South), similar to a compass and the Kailash peak constitutes the focal point which masks all other ranges in the vicinity due to its towering pyramidal feature with grooves and snow. It is the ultimate place of pilgrimage for Hindus who consider it as the abode of 'Shiva'. For Buddhists, particularly the Mahayana Buddhists of Tibet and the surrounding region, call it the mountain ***Kang Rinpoche***, ***'the precious snow mountain'***. For them, this is the cosmic mountain, a link between the physical world and the spiritual universe. However, prior to the introduction of Buddhism in Tibet, the prevailing faith was the Bon Po religion and for them Kailash is ***the nine-storied swastika mountain, the mystical soul of the Tibetan plateau.***

For Jains, Kailash is known as Mount Ashtapad, where the founder of the faith Aadinath / Rushabhdev, the first Tirthankar of Jainism was said to have attained spiritual liberation (Nirvan). Subsequently his son King Bharat Chakravarti was said to have constructed a temple name Ashtapad in memory of Aadinath / Rushabhdev. This description was strengthened after the frequent visit of the Kailash Mansarovar area by Shri Bharat Hansraj Shah. According to him, there are innumerable sculptures in the vicinity of Kailash and Nandi Mountain which looks like a creation of mankind in the historical past as they also confirm well to the Jain scripture. This prompted the New York based, Jain Center of America to launch a scientific investigation in 2006. In continuation of this endeavor, another team of researchers visited the area during July – August 2007.

This report forms a part of the geological investigation carried out in the Kailash Mansarovar area with the objective to understand the evolution of the sculptured landscape particularly in

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the south eastern and south western part of the Kailash and Nandi area. In addition to this, the terrain above Gyangdrag Gompa was investigated for the evidence of past human inhabitation. An exploratory attempt in this area was first made by the team that visited the Kailash Mansarovar in 2006 and found that the terrain has indeed evidence of past inhabitation. The methodology adopted in the present investigation involved field survey supported by the topographic map and satellite remote sensing data.

We begin with the morphology of the inner Kora area, followed by a generalized geological description. This is succeeded by an overview of the Earth's surface processes around Kailash and Nandi Mountain. We feel that the sequence of description adopted in this report would help a common reader to appreciate the mechanism responsible for the development of the sculptured landforms around Kailash region

Map showing Kailash area details

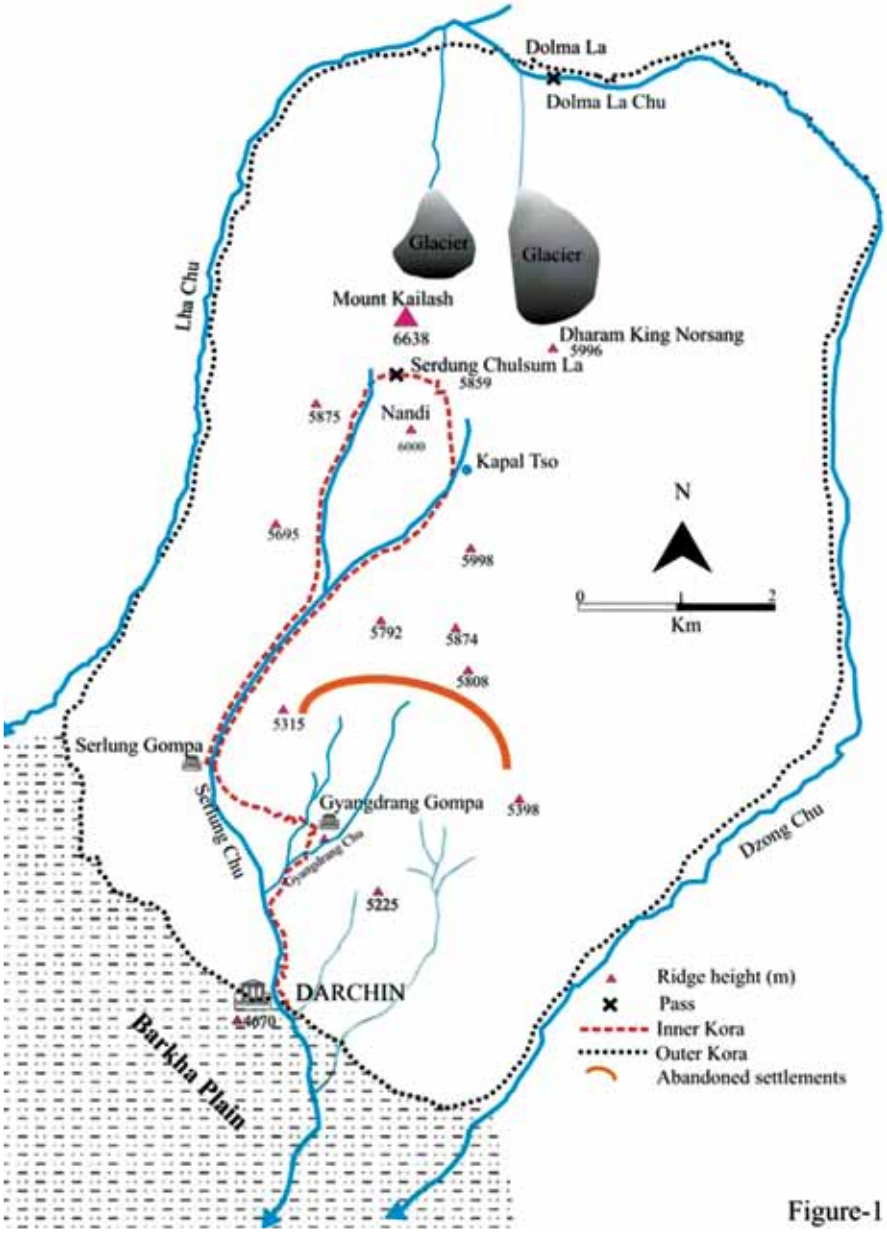

Figure-1

Morphology and Geology of the area

Kailash Mountain together with the east-west trending mountain (Kailash ranges) constitutes the northern boundary of the Trans – Himalayas. Alternatively, the Kailash ranges lies in the zone of collision between the Indian and Tibetan plate. After traversing the snow clad Himalaya in the south, one enters into a wide (~20 km) Barkha plain on which lie the Rakshas and Mansarovar Lakes. The Kailash ranges rise abruptly north of Darchen village and continue north of the Kailash Mountain. ***Dzong Chu*** and ***La Chu*** (Chu River) are the two major rivers that have sources outside the Kailash Mountain and drains through the eastern and western boundary of the Kailash range (Figure 1). From the northern face of Kailash two small streams emanate from the ***Gangjam glacier***(Kailash Mountain) and ***Polung glacier***(Dharma King Norsang) and flows few kilometers northwards before meeting the ***La Chu*** and ***Dolma La Chu***. These rivers finally join in the Barkha plain and eventually drain into the Rakshas Tal in the south. The outer Kora follows along these rivers. In addition to this, there lies an inner Kailash basin with a very common southern face of the mount Kailash looking towards ***Mansarovar and Rakshas Tal.*** The inner Kailash basin drained by ***Serlung Chu*** named after the *Serlung Gompa*. Besides this, a rather small groundwater fed stream called the ***Gyndrang Chu*** drains through the eastern part of the inner Kailash basin and flows towards Darchen in the south before finally merging with other streams in the Barkha plain (Figure 1).

Towards the south of the Kailash Mountain, in the vicinity of Darchen the complex rock type dominated by sandy slates, red sand stones, radiolarian chert along with the lenses of dolomite. These rocks at places intercalated with volcanic rocks (Ophiolite). It is suggested that rocks constituting the Kailash ranges including the Kailash Mountain were deposited during the upliftment of the Himalaya and Kailash ranges can be considered to be the northern limit of the Himalaya. One can clearly demarcate two distinct types of rock geometry (structure). In the foothill areas the rocks are folded and comprises sandy slates, red sand stones, radiolarian chert with dolomite lenses, whereas around Kailash mountain the rocks are nearly horizontal (marginal northward tilt) and dominated by cemented boulders with subordinate sandstone and slates. These rocks are known as the famous Kailash Conglomerate and were deposited over the granite basement. A close scrutiny of the conglomeratic horizons shows the presence of vertical fractures cutting across the horizontal beds. Kailash peak (6638 m) and Nandi Mountain(6000 m) are formed by the Kailash Conglomerates with sub-ordinate contribution from sandstone and shale. The two mountains (Kailash and Nandi) are connected by a small southeast trending rocky ledge at 5859 m (***Serlung Chuksum La,*** Figure 1). The top of the Nandi Mountain which mimics lion face, a pyramid and Bull is developed on the conglomerate horizon. This horizon contains boulders of granite, sandstone and quartzite whose size varies from few cm to around 1 m. Kailash and Nandi Mountains are surrounded by ~600 m deep valleys carved by the glaciers in geological past. In the lower part (from valley bottom to ~300 m above) the Nandi Mountain is covered with angular rock fragments occurring as fan shaped bodies (scree deposit).

Earth surface processes: Past and Present

Three major earth surface processes that were operated and are still being in operation in the basin are the (i) glacial process (ii) frost action and (iii) river erosion. These processes have

shaped the present day landscape that we see around Kailash and Nandi Mountain and are discussed below.

Glacial Activity

Masses of moving ice known as glaciers are one of the most effective sculptures (geomorphic agent) on the earth surface which have transformed the appearance of the higher Himalayan ranges. Moving masses of ice not only erode the valley bottom, but also effectively plucks the valley walls thus forming broad **'U'** shaped valleys which are typical features of a glaciated terrain. Widespread occurrence of such valleys has been found in the Kailash region indicating that there was a time when glaciers were more extensive compared to present.

Serlung Chu valley

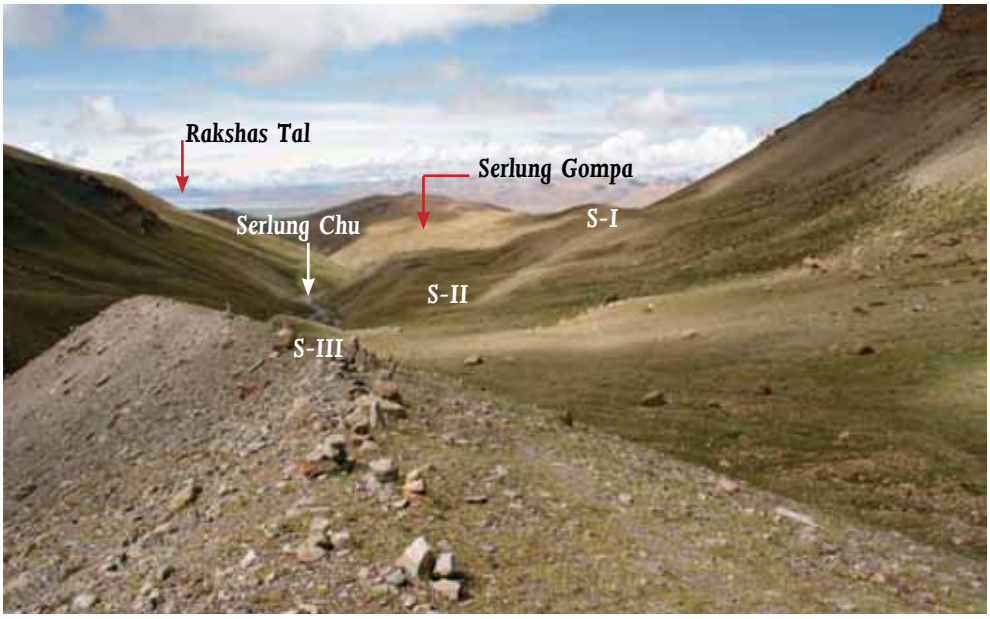

Fig.2: Three glacial stage, S-I, (oldest) to S-III, (youngest). Note the Rakshas Tal at the far end

This is also evident by the presence of lateral moraines (sediment deposited by the moving glacier along the valley wall as trail) particularly in Serlung Chu valley (Figure 2). Based on the position and distribution pattern of the lateral moraines, we could identify at least three glacial advancements viz. the Stage-I (S-1) the oldest and Stage-III (S-III) the youngest that might have occurred in the geological past around the Kailash area. Based on their occurrences in the valley it was observed that the oldest and longest glacier advancement reached around the foot hills in the vicinity of Darchen (~4700 m). The second advancement extended few hundred meters below Serlung Gompa (4850 m) whereas the third and smallest was restricted to a few hundred meters below the Nandi Mountain at around 5200 m. The glaciated basin carved by multiple phases of glaciation has caused differential erosion in the area. As a result we find the conglomerated being more resistant beds being projected out in the glaciated basins around Kailash and Nandi Mountain, whereas, the less competent shale forms grooves (at places lateral cave like topography). From a distance and even in Satellite data they appear as table land topography similar to what we observed in the Deccan basalt country (Figure 3).

Sculptures carved by wind, snow and differential erosion

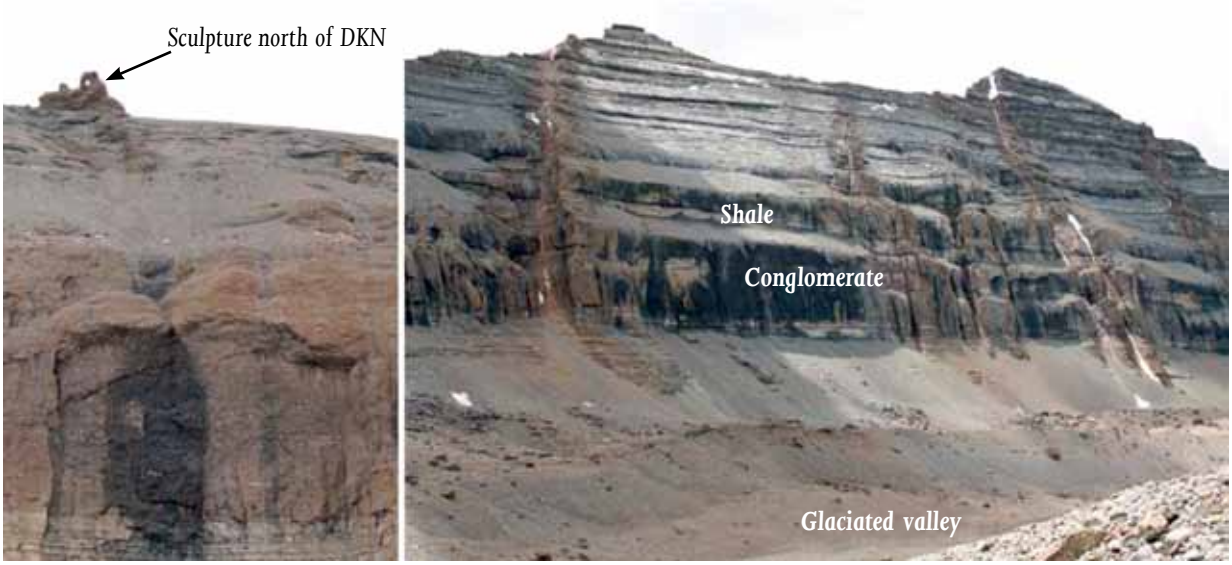

Fig. 3: Sculpture carved by snow and wind erosion — Glaciated valley southeast of Kailash Mountain with differential erosion of conglomerate and shale

Dharma King Norsang

Fig.4a: Glacial striations in the vicinity of Nandi

In addition to this, when a glacier moves on the rocky bottom, it produces smooth rock surface with scratches and grooves parallel to the direction of glacier movement. These features are called the glacier striations. We could also find them on sand stone basement at heights 5300

Shattered debris due to frost action

Fig.4b: Glacial striations in the vicinity of Nandi

m and 5700 m respectively while climbing the Serdung Chuksum La that connects the Kailash with that of the Nandi Mountain (Figure 4). Presently, the valley glaciers on the southern slope of the Kailash Mountain are virtually absent. Instead one can see the avalanche snow that extends at the foot of the Kailash Mountain on the eastern and western valleys. It is likely that during winters a marginal increase in the snow occurs, which is insufficient for sustaining a permanent valley glacier. It can be inferred that presently influence of valley glaciers in landscape development is virtually insignificant.

Frost Action: Frost action is a type of mechanical breakdown of rocks where water actually seeps into cracks in the rock. The water freezes as the temperature drops, it expands and eventually creates a wedge inside the rock, encouraging it to crack and split apart. Also known as frost shattering, this type of weathering occurs mainly in environments where temperatures frequently fluctuate above and below freezing point that is, mainly in areas proximal to glaciers (periglacial areas).

This is the case around Kailash and Nandi Mountain. This action is amplified in areas where fractured or highly porous rocks are present as we have seen in the Kailash conglomerate which is not only porous but also contain vertical fractures (Figure 5). The broken rock fragments eventually rolled down the slopes due to the gravity and forms conical apron of unconsolidated debris also known as the scree or talus slopes which are quite common in the higher Himalaya. In the Kailash region, particularly around Nandi Mountain and the western flank of the Dharma King Norsang, a thick apron of frost shattered debris covering the lower part could be seen (Figure 6). In order to ascertain their source, rock samples were collected at regular intervals around the inner Kora that circles the Nandi Mountain. These broken rock fragments were dominated by conglomerate and subordinate sand stone which constitute the Nandi Mountain. Considering that the top of the Nandi Mountain (6000 m) consists of the conglomerate with

adequate porosity, it facilitates the frost action by way of freezing and thawing of the snow. The present day morphology of Kailash and Nandi Mountain is an outcome of the combination of glacial activity supported by frost action during the geological past and will be discussed later.

Conglomerates in Kailash area

Fig.5: Vertical joints in Kailash conglomerate & Conglomerate closeup

Frost shattered scree slope

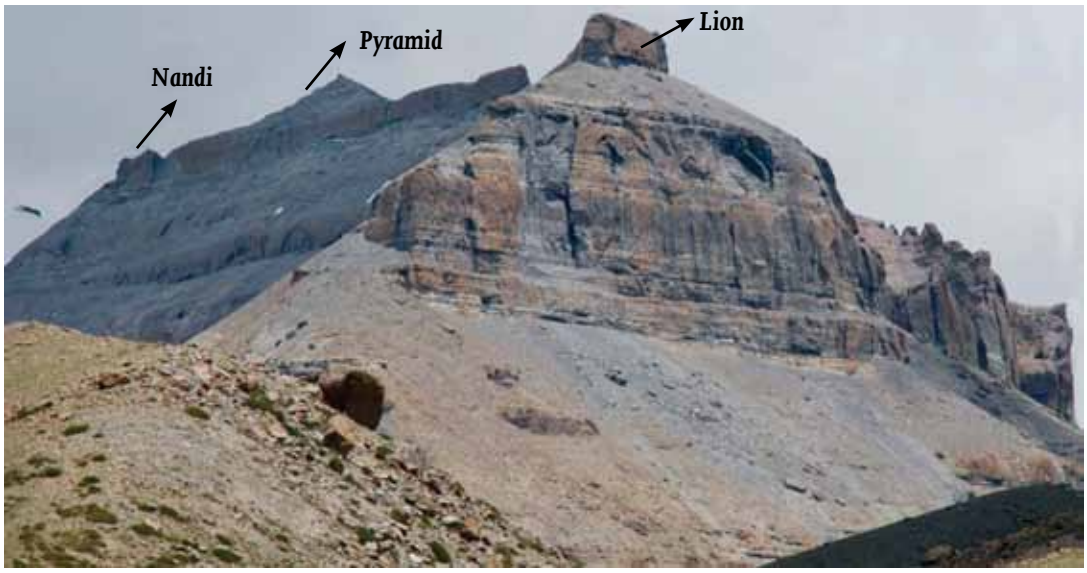

Fig.:6 Frost shattered rock covered slope (scree slope)

River Erosion: Rivers in areas proximal to glaciated terrain (periglacial areas) are characterized by irregular and flashy discharges. Alternatively, it can be said that the hydrology of glacial fed streams in periglacial zone is highly fluctuating. Prolonged periods of sub-zero temperatures results in completed cessation of flow and therefore, all river (fluvial) activity. However, during

springs or early summer thaw, the sudden increase in melting at times caused catastrophic floods that may though exists for a short period of time, but can erode and transport enormous glacial debris downstream.

Since such rivers carry large sediment load, which clogs their course, hence one may find multiple distributary channels in the periglacial areas (braided river course). Such rivers lack the power of erosion (removal of rock material) instead they trend to deposit the sediment along their course (aggradational type).

We have observed that the two streams that originate from the eastern and western flanks of the Nandi Mountain (southern Kailash basin), flows as braided streams till they meet at the southern flank of the Nandi Mountain (Figure 1). From here onwards till the Serlung Gompa, it has deeply incised the glacial deposits suggesting that the river has capacity to erode and transport sediments down valley. Again the river becomes depositional type (aggradation) till it debouches into the Barkha plain at Darchen through a narrow gorge carved on crumpled and folded phyllite rocks. Based on these observations, it was inferred that little role played by the rivers (particularly after the retreat of the glaciers) by way of incising the glacial deposits only (Lateral moraines) in the southern Kailash basin.

Sculptured Features

Features like Shiv Ling, bull, lion, pyramid etc. have drawn the attention of the people in the recent times (Figure 6 and 7). It was Shri Bharat Hansraj Shah who based on his repeated observations made during many visits to Kailash-Mansarovar suggested that they appeared to have been carved by human beings. In fact in Jain scriptures these features have been mentioned. A detailed description was provided by Shri Bharat Shah in his article 'Ashtapad Model' published in Volume II. Needless to say, that these features look as if, someone has carved them with a chisel and hammer on the rocks around Kailash and Nandi Mountain. During his visit these features were inspected from maximum proximity in order to assess their morphology and ascertain the presence of old human settlements. Considering the high altitude and ruggedness of the terrain around Kailash and Nandi Mountain, the work was quite demanding and risky in the hostile high-altitude environment.

As discussed above, majority of the structures were developed on Kailash conglomerate which contain boulders of varying shape and size. Further the conglomerate horizons are porous and fractured. Such rocks are rarely used by human beings for carving any features (a more firm statement can be made by an archaeologist in this regard). However, authors own experience of working in the Kashmir valley with archaeologists, has seen that during the Neolithic period (~7000 years ago) people living at Burzahoma site in Kashmir which lies close to the limestone dominated Himalayan flank, seldom used the easily available limestone in the vicinity as raw material for making tools. That is because limestone is soft and is susceptible to chemical and physical wear and tear. Hence, these people went all the way to the southern ***Pir Panjal Mountain*** (~150 km south of Burzahoma) and used fine grained hard and compact volcanic rocks (Basalt). People who use rocks to make sculptures know it better that hard, compact and fine grained rocks are better material to work with. Also, it would be difficult to work with a material that

flakes and breaks frequently due to the presence of inherent porosity and fractures. Further, working with rocks containing innumerable sub-rounded to rounded boulders would not be easy to work with and create smooth surfaces of various shapes and sizes. But the fact remains that innumerable major and minor features, one could see in the vicinity of Kailash and Nandi area are developed on boulder dominated Kailash conglomerate rock.

The minor features such as the Shivling, or multiple pinnacles mimicking human figurines are developed on the sharp crested ridges that separate glaciated valleys around Kailash and Nandi Mountain (Figure 7). For example, if one looks at the right shoulder of the southern face of Kailash, there are a series of pinnacles present on the sharp edged valleys surrounding the Kailash Mountain. These features are frequently found in glaciated terrain and were known to glacial geomorphologists as the arête (a thin ridge of rock that is left separating the two valleys) and formed when two glaciers erode parallel 'U' shaped valleys (the southeastern and southwestern glacial valleys around Kailash Peak). Due to frequent frost action as discussed earlier, rocks are broken which give rise to various shapes and Shivling or human shaped pinnacles on arête are such examples (Figure 7).

Pinnacles and Shivling formed due to frost action and glacial abrasion

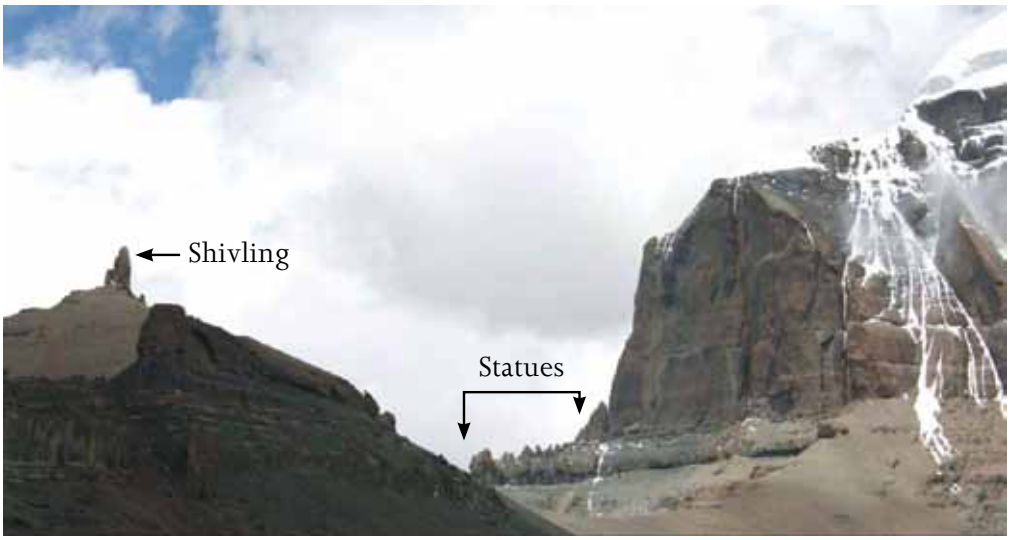

Fig.7: Series of pinnacles at the western shoulder of Kailash and Shivling. These features are formed where two adjacent glacial valleys meet (Arete). The pinnacles developed due to the combination of frost action and glacial abrasion as discussed in the text.

In fact the holy Kailash Mountain itself looks like a pyramidal shaped mountain. Such features are usually developed where glacial action from three or more sides deepens the valleys and are called **Horn**. These features (looks like a spire of rock) form by headward erosion of a ring of cirque (hanging glaciers) around a single high mountain. When the glaciers originating in these cirques finally disappear, they leave a steep, pyramidal mountain outlined by headwalls of the cirques.

On Nandi Mountain, lion and bull faces are developed on the conglomerate bed which forms a curvilinear feature and trends north-south and is abruptly terminated at both ends. In the south, a triangulated spur can be seen (Figure 6). These are the erosional features carved due to

the combination of past glacial action and on-going frost shattering in the area. The southern vertical Nandi Mountain slope is nothing but a truncated spur developed when a moving body of ice has difficulty in manipulating the curves of the stream valley (Figure 6). As we have observed that in the southern Kailash basin, valley glaciers were quite extensive during the geological past. Hence, while these glaciers descended, they tend to simplify and straighten their course. In this process of straightening, the ice snubs off any spurs of land that extend into it from either side. The cliff thus formed by this process is shaped like a large triangle or something like a flatiron with the apex upwards. The present day topography of the Nandi Mountain can be attributed to this process.

Man-made Structures

We have also observed some caves developed on the shale and sandstone horizon. These caves are not very deep. One such cave was found at a height of 5900m in Kailash Mountain containing chortans.

Man-made Structures – cave and chortens

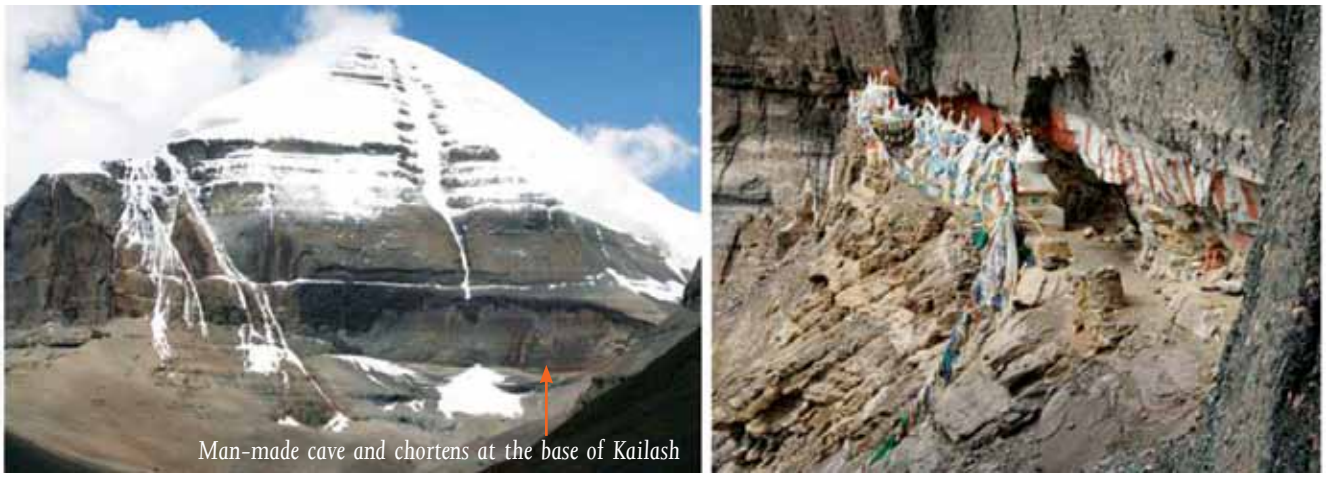

Fig.8: closeup of the cave and chortens

Antiquity of these caves is uncertain but they are still maintained and painted with ocher and lime (Figure 8). These caves were un-inhabited when we visited the sites and during our brief stay at the caves, it was not possible for us to look critically for samples that could have been used for ascertaining the antiquity of the caves using radiometric dating techniques such as radiocarbon or luminescence dating techniques.

Abandoned settlements near Gyangdrag Gompa

In addition to the investigation made around Nandi and Kailash Mountain, we also re-visited the mountain above Gyangdrag Gompa which was earlier visited by the 2006 team. This time we went right up to the ridge that constitutes the southeastern margin of the Kailash Mountain. Climbing along the stream it was observed that there are two rocky curvilinear ledges overlooking the Barkha plain on which we found a number of abandoned multi-chamber houses (Figure 1 & 9). Some of them were very crude but others were meticulously constructed, with mud thatched roofs (Figure 9). According to Ruth and Flavieu (a Swiss couple)

who stay at Gyangdrag Gompa, they were probably used as meditation centers. There is no authentic information as to who lived in these stone houses and when they were constructed or abandoned. These structures need further investigation by a team of geo-archaeologists.

Fig.9: Abandoned settlements with reference to the Gyangdrag Gompa. (A/B) House built on fractured conglomerate (C) Inner layout of the abandoned house (D) The mud covered roof of the abandoned house

According to Ruth and Flavieu, Aadinath attained Nirvana at Sangeshukti located to north of Gyangdrag Gompa. This is the area where we have found a number of settlements which are currently in ruins. In addition to the probable Ashtapad Mountain identified by P.S. Thakker during the 2006 visit (north-east of Gyangdrag Gompa), Dharma King Norsang is also located in this region. This time again, Dr. Thakker made an attempt to reach the Dharma King Norsang and probable Ashtapad site which was identified using the IRS-LISS-IV data and GIS technique. Unfortunately, due to the lack of infrastructural facility, he could not reach up to the structure and verify it on the ground. These sites are shown in Figure 10 (A) which is drawn based on the IRS-LISS-IV data (Figure 10 (B)). Before any conclusions are drawn towards the existence or non-existence of historical people around Kailash Mountain, these sites need to be physically examined.

Geo-morphological map based on satellite data

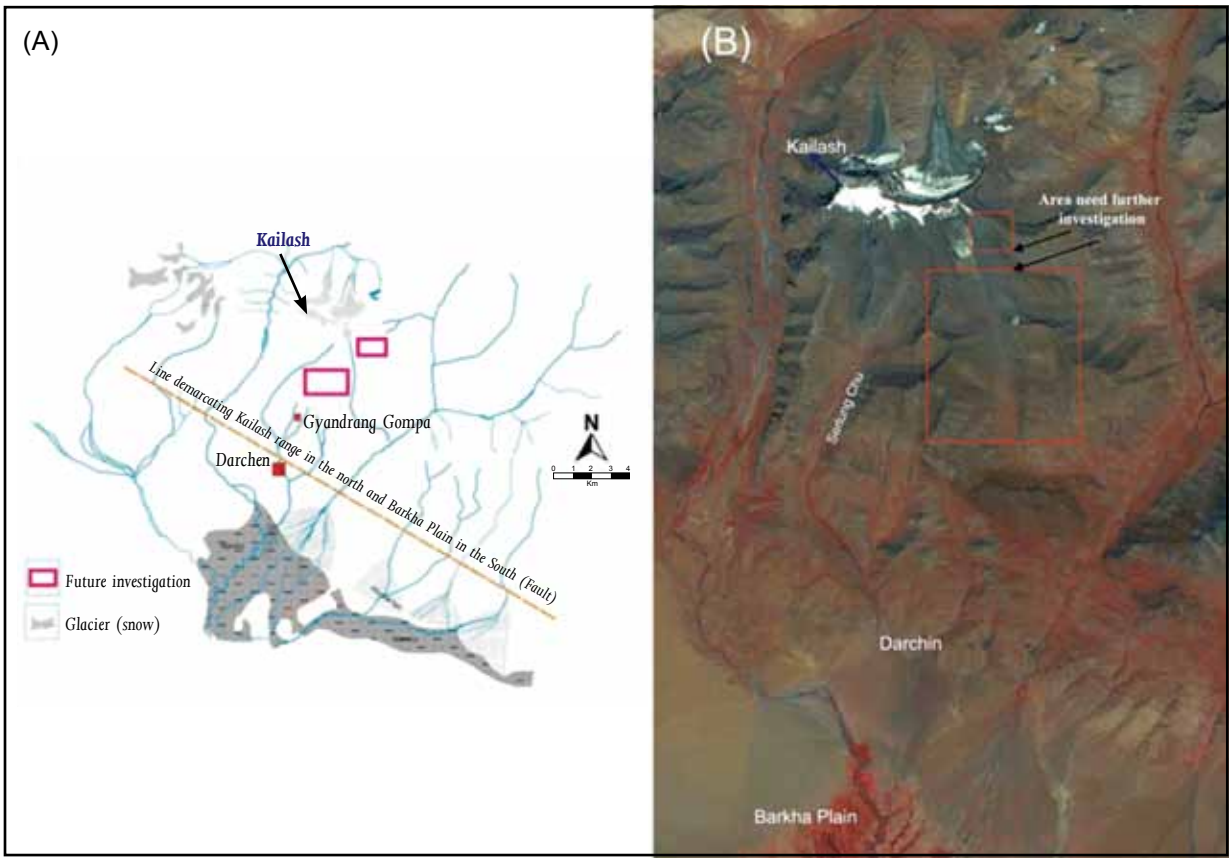

Fig.10: (A) Geomorphological map based on the Satellite data (B) The areas which need future investigations.

Summary

Summarizing the above observations made in the southern Kailash basin, it can be suggested that the area around Kailash Mountain was developed after the collision of the Indian and Tibetan plate in the geological past (millions of years ago).

After the wielding of the two land masses continued, northward movement of the Indian plate gave rise to the Himalayas. Erosion of the uplifted ranges provided sediments in shallow basins where the sediments that gave rise to Kailash Mountain were deposited.

Uncertainty prevails about the origin of major rivers, however, geomorphological evidences tend to make us believe that the rivers like Sutlej, Indus and Brahmaputra that are sourced in this region existed prior to the formation of the Himalayas.

There is no authentic data to suggest when glaciers appeared in the Himalayas, however, climatic data from the region indicates that it must have happened when the Himalayan ranges attained the critical elevation of around 5000m which is required in a temperate region for rain to freeze. It is suggested that the Himalayas together with the Tibetan plateau attained the critical elevation around 20 to 10 million years ago. If this is so, then it would imply that the area around Kailash must have begun to witness the glaciation around this time and continued during the recent geological past.

The deeply incised glaciated basins around Kailash are the outcome of prolonged glacier action. We have the direct evidence of extensive glaciers in the region in the form of lateral moraines suggesting that glaciers then were more extensive compared to present.

Once the glacial climate initiated in the Kailash area, various glaciogenic features such as ***Arete, Horn, truncated spurs, Table land topography, Grooves and Protrusions*** (differential erosion) were developed. These features were mistaken for man-made features.

There are man-made features such as the caves at around 5900m in Kailash and the abandoned settlements on the curvilinear ridge above Gyangdrag Gompa. The former looks to be recent whereas the latter goes back to the historical period. A firmer statement to this can be made once these structures are investigated by the geo-archaeologists, preferably having expertise on mountain archaeology.

Though not visited this time, however, it would be worth investigating the ruins and the innumerable caves made in the sediments deposited by the Sutlej River around the Sib Chu gorge (Tsaprang / Tolling Math area). This region has the preserved ruins of the Guge Kingdom implying that one of the ancient civilizations lived in this part of western Tibet. Also this was one of the most frequented routes to the Kailash Mountain. Currently the region is occupied by people belonging to the Bon Po faith.

Acknowledgement

We are grateful to the Jain Center of America, NY for giving us the opportunity to undertake this study in the Kailash Mansarovar area. The financial support given by Shrut Ratnakar, Ahmedabad is duly acknowledged. All the team members extended their cooperation during this investigation. The author would like to express his gratitude towards Kaji Sherpa, as without his assistance, it would have not been possible for him to investigate the caves at 5900m below the Kailash peak.

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Chapter - 06

Climate and Study of Glaciers

• Glaciers, Rivers and Lakes of Kailash area	Photo Gallery
• Late Holocene Monsoonal Temperate Glacier Fluctuations on the Tibetan Plateau	Bao Yang
• Tibetan Plateau formation, Climate and Ecosystem	Erwin Appel and Volker Mosbrugger
• Geomorphic evidence of Glaciations around Mt. Kailash (Inner Kora) : implication to past climate	Navin Juyal and P.S. Thakker

Introduction

The Tibetan Plateau and Himalayan mountain range has one of the Earth's most imposing topographic features and has the largest glaciated area outside the polar region. Glaciers are the thick sheets of ice covering the region. They are not only important in shaping the landscape, but are also excellent records of past climate that determine the life and culture in the region. They retreat and advance in response to climate changes. The glaciers movement deposit large amount of debris or moraine along its route. The moraine distribution determines the past glacial extent and climate in the region.

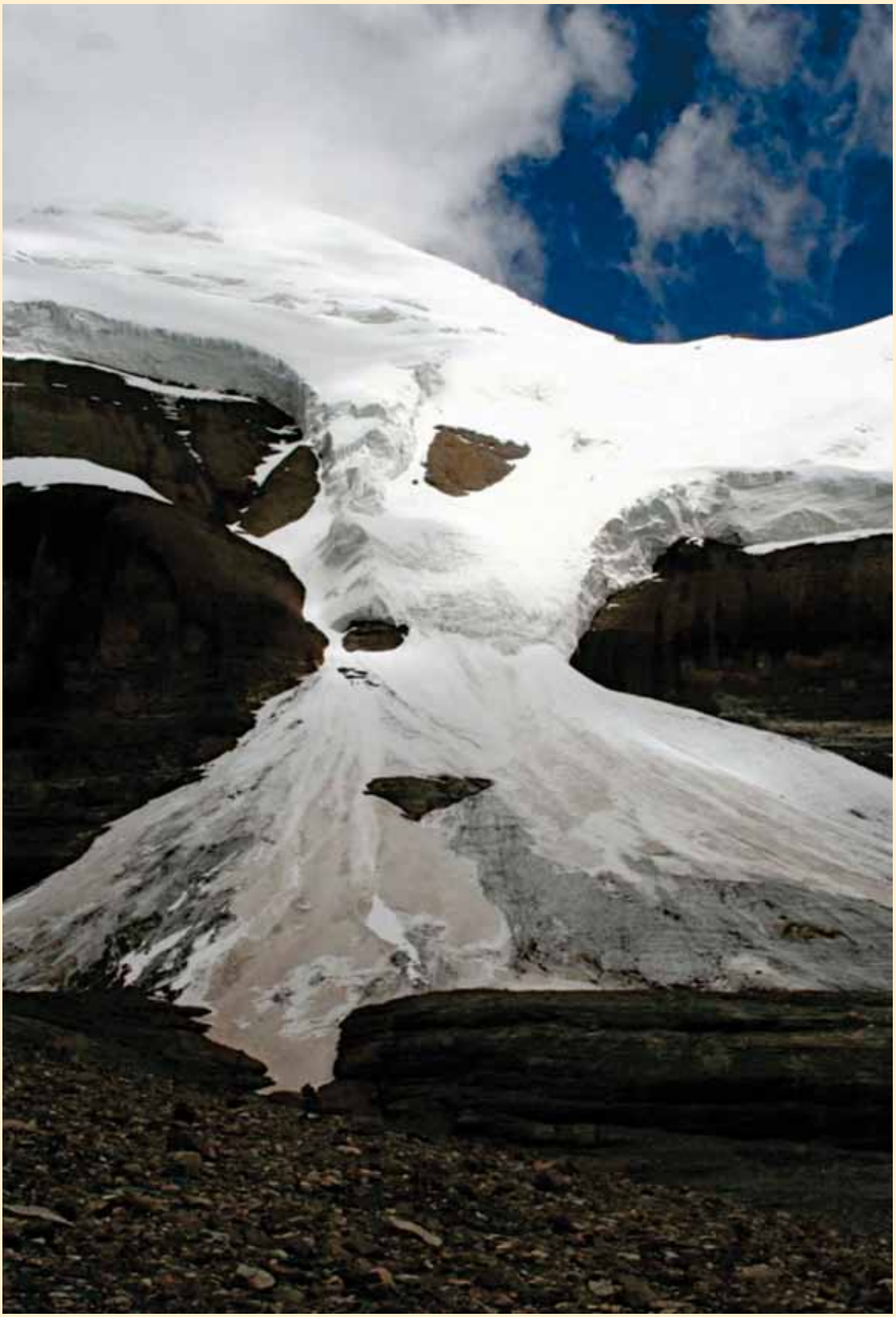
Article by Bao Yang discusses the Late Holocene Monsoonal Temperate Glacier Fluctuation on the Tibetan plateau. Erwin Appel discusses Tibetan plateau formation, climate and ecosystem. They have given their observations in detail. The third article by Navin Juyal specifically describes the geomorphic evidences of glaciation around mount Kailash and its implications to past history with field photographs and site maps.

Various photos of glaciers, rivers and lakes of Kailash area are given here.

Glaciers, Rivers and Lakes of Kailash area

Frozen River

Gauri Kund



A View of the Glacier

East Face of Kailash

Waterfall

Glacier

Walking on the Glacier

The Longest Lake- Yamdrok Lake

Sand Dunes - Snow - Lake

Rakshas Tal

A lake on the way from Lhasa to Kailash

Mansarovar

Mansarovar

A view of Mansarovar at Night in Moon light

A view of Mansarovar at Night in full Moon light

19 Late Holocene Monsoonal Temperate Glacier Fluctuations on the Tibetan Plateau

Bao Yang

Abstract

We established a chronology of monsoonal temperate glacier fluctuations in China during the last two millennia based on radiocarbon ages of fossil wood buried in moraines, lichen-dated moraines and tree ring evidence. The chronology includes data from 16 glaciers in the southeastern Tibetan Plateau including the Hengduan Mountains, the central and eastern parts of the Himalaya Mountains, and the eastern Nyainqentanglha Range. Three main periods of glacier advances are identified: around 200 600 AD, 800 1150 AD, and 1400 1920 AD. The glacier advance at about 400 600 AD was the most widespread advance in the southeastern Tibetan Plateau. Basically synchronous glacier advances occurred in the southern Himalayan Mountains during 380 600 AD, 870 1100 AD, 1400 1430 AD and 1550 1850 AD. The glacier advance around 1000 AD also occurred in the central Himalayas. Temperatures in the southeastern Tibetan Plateau calculated from Equilibrium Line Altitude (ELA) depression were 1.0 °C, 0.7 °C, 0.4 °C and 0.1 °C lower than at present (1989 AD) during the periods of 200 600 AD, 800 1150 AD, 1400 1650 AD, and the 19th century, respectively. On a centennial timescale, temperature changes rather than precipitation changes caused by variations of the south Asian summer monsoon are the controlling factor for glacier fluctuations. The widespread glacier advance during the 19th century was probably partly attributable to the result of increased winter snowfall in the central Himalayas.

Keywords: glacier fluctuations; climate change; monsoon intensity; Tibetan Plateau; Holocene

1.0 Introduction

The Tibetan Plateau and Himalayas are one of the Earth's most imposing topographic features and the largest glaciated area outside the Polar Regions. They are mainly affected by two climatic systems, the mid-latitude westerlies and the south Asian monsoon. The southern slopes of the Himalayas and the southeastern Tibetan Plateau are predominantly controlled by the south Asian summer monsoon (SASM) and thereby receive snowfall mainly in summer, whereas the more northern and western parts of the Tibetan Plateau and adjacent mountain regions (e.g., Hindu Kush, Karakoram) are more strongly influenced by the mid-latitude westerlies from the Mediterranean, Black Sea and Caspian Sea and receive most snowfall in winter (Benn and Owen,

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1998). Many studies on glacier fluctuations during the late Quaternary were conducted in the Tibetan Plateau and Himalayas and significant progress has been made in recent years, which is attributable to the development of Cosmogenic Radio-Nuclide (CRN) surface exposure and optically stimulated luminescence (OSL) dating (Richards et al., 2000a,b; Owen et al., 2003; Barnard et al., 2004a,b; Owen and Bern, 2005).

1.1 Late Pleistocene glacier fluctuations

The idea has been gradually developed that late Quaternary glaciations may have been asynchronous between different regions of the Tibetan Plateau and the Himalaya, and that the maximum expansion of Karakoram and central and western Himalayan glaciers occurred between 70 and 30 ka, corresponding to Marine Isotope Stages (MIS) 3 and 4. At the time of the Last Glacial Maximum (MIS 2), glaciers were in a limited expanded state, implying that precipitation (delivered by an active SASM) rather than temperature change was important in controlling glacier fluctuations over the last glacial cycle (Benn and Owen, 1998; Phillips et al., 2000; Richards et al., 2000a,b; Owen et al., 2001, 2002a,b,c, 2003; Finkel et al., 2003; Zech et al., 2003; Barnard et al., 2004a,b; Owen et al., 2005; Lehmkuhl and Owen, 2005). Recent studies show that in the arid interior regions of the Tibetan Plateau, at the extreme margins of monsoon influence, glaciation was very limited in extent during the last glacial cycle (Lehmkuhl et al., 2002; Yi et al., 2002; Schafer et al., 2002; Owen et al., 2003; Klinge and Lehmkuhl, 2004). This suggests that glaciers beyond the margins of the monsoon influence behaved differently from the monsoon-affected glaciers throughout the Late Quaternary (Owen et al., 2005).

1.2 Late Holocene glacier fluctuations

Few studies have been concerned with Holocene glacier fluctuations on the Tibetan Plateau and bordering areas (Wang and Fan, 1987; Zhou et al., 1991; Lehmkuhl, 1997; Owen et al., 2005). Furthermore, only a few studies have concentrated on the comparison of glacier extents between the Little Ice Age (LIA) maximum and the present on the Tibetan Plateau by applying aerial photos, satellite images, topographical maps and derived digital elevation models (Liu et al., 2002a,b; Pu et al., 2002; Wang and Ding, 2002). Little is known about glacier fluctuations in monsoonal temperate glacier areas and their response to climatic change on a centennial timescale in the context of the past two millennia, a period that includes the Medieval Warm Period (MWP) and the LIA (Reyes et al., 2006). Reyes et al. (2006) recognized a widespread glacial advance in the first millennium centered at 400-700 AD in Pacific North America by using numerous radiocarbon ages and lichen dates that had not been fully recognized at the time of the pioneering work of Denton and Karlen (1973). This demonstrates the great potential of revealing regional glacier fluctuations and hence regional climate variability on a centennial timescale by compiling a great number of radiocarbon dates and other types of moraine ages.

In this paper, we compile glacial geologic data based on radiocarbon ages on buried wood, tree ring evidence, and lichenornetric data from monsoonal temperate glacier region for this period. We then give a general picture of glacier fluctuations of the southern Himalayan region according to previous radiocarbon dating of fossil soils, and finally make a comparison with climate reconstructions for this region during the last two millennia.

2.0 Local evidence for late Holocene glacier advances

Monsoonal temperate glaciers are mainly located in the southeastern Tibetan Plateau including the Heng-duan Mountains, the central and eastern parts of the Himalayan Mountains, the eastern segments of the Nyainqentanglha Mountains, the eastern Tanggula Mountains, and the southern Himalayan Mountains. In China, the monsoonal temperate glaciers have an area of 13,200 km^2 which is 22% of the total glacier area (Shi and Liu, 2000; Su and Shi, 2002). These regions are predominantly controlled by the South Asian summer monsoon with an annual precipitation of 1000-3000 mm. The equilibrium line altitude (ELA) of most glaciers ranges from 4200 m to 5200 m. The mean annual air temperature at the ELA is about -6 °C. Summer (June-August) temperature varies between 1 °C and 5 °C, while the temperature of the ice ranges between 0 °C and -4 °C, but is usually above -1 °C. The monsoonal temperate glaciers are characterized by both accumulation and ablation in the summer season.

The main evidence for glacier expansion in the study area (Fig. 1) during the last two millennia consists of radiocarbon ages from buried tree trunks and branches recovered from glacial sediments and paleosols, together with lichen-dated moraines and tree-ring evidence.

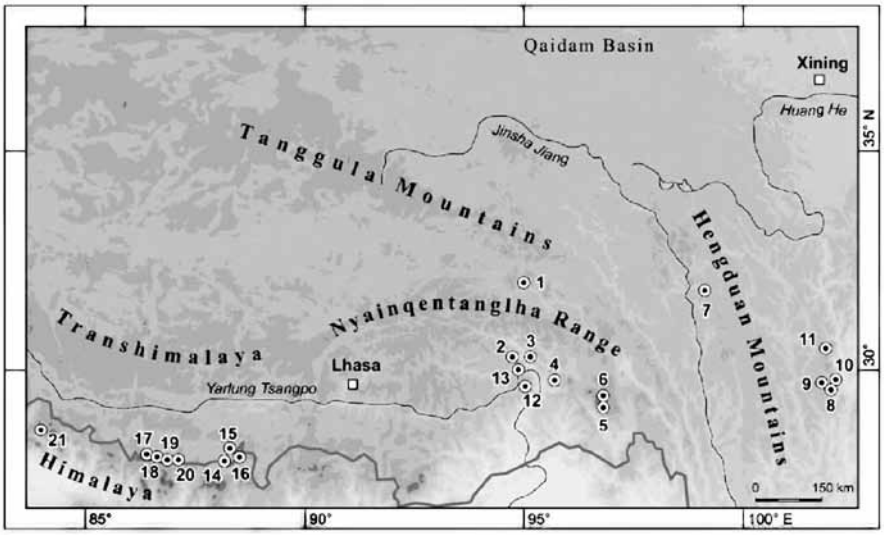

Fig.1: Locations of studied glaciers in different parts of the southern Tibetan Plateau: Eastern Tanggula Mountains (No. 1), Eastern Nyainqentanglha Mountains (Nos. 2-6), Hengduan Mountains (Nos. 7-11), eastern part (Nos. 12-13), central part (14-16) and southern part of the Himalaya Mountains (17-21).

According to Geyh et al. (1985), radiocarbon ages from in situ buried wood (branches and trunk) are regarded as the most reliable material for dating the onset of glacier advances. Innes (1985) noted that lichen dates provide a rough timing for moraine formation and are not accurate enough to give a precise chronology, owing to the different rates of lichen growth in different environments. Here we include the lichen dates for comparison, because they can provide a reference and are helpful over the last centuries when the radiocarbon ages can be problematic (Serebryanny and Solomina, 1989; Nar-ama, 2002; Rabatel et al., 2005). Here each lichen date used was obtained by a control-point linear correlation between known age and maximum diameter of lichen rather than by establishing lichen growth curves. For example, a maximum-diameter lichen (2 cm) *Rhizo-carpon geographicum* growing on a fan formed by a

glacial lake outburst flood event in 1940 was found in 1974. The dates of known maximum-diameter lichens growing in other moraines can be estimated by linear extrapolation using the average growth rate (0.06 cm/a) of *R. geographicum* during 1940-1974. The uncalibrat-ed radiocarbon ages of buried wood were converted to calendar years using the OxCal program v3.10 (Bronk Ramsey, 1995, 2001) from IntCal04 data in Reimer et al. (2004). Radiocarbon dates are presented as 28 calibrated range which means a dating certainty of 95% that the real date falls within the given date range.

2.1 Eastern Tanggula Mountains

The eastern Tanggula Mountains lie in the transition zone from monsoonal temperate to continental glaciers. Li et al. (1986) noted that the mean annual temperature at the equilibrium line (at 5200 m asl) in the Bujiagangri region is -6 °C to -7 °C. Only LIA glacier fluctuations of Poge Glacier (No. 1, Fig. 1) were studied. According to four lichen dates on moraines this glacier advanced about 1809, 1857-1888, and 1920 AD respectively (Li et al., 1986). The maximum glacier extension during the LIA occurred before 1809.

2.2 Eastern Nyainqentanglha Range

The eastern Nyainqentanglha Range is situated on the southeastern part of the Tibetan Plateau. Many large monsoonal temperate glaciers are developed in this region because it is situated just north of the "Great Bend" of the Yarlung Tsangpo River. The humid monsoon air mass, which penetrates through the "Great Bend", brings abundant moisture to the region. Li et al. (1986) noted that the mean annual and summer (June-August) temperatures at the equilibrium line (at 4500 m asl) on the Arza Glacier are -2.6 °C and 5 °C, respectively, with an annual precipitation of 3000 mm. These climatic conditions make the glaciers very active. Trees are often trapped and buried by advancing glaciers, providing opportunities for radiocarbon dating. Glacier expansion in the Eastern Nyainqentanglha Range during the last two millennia has been recognized at Arza, Laigu, Zepu and Ruoguo Glaciers.

Li et al. (1986) carried out a detailed study on Ruoguo Glacier (2; Fig. 1), which is a 13.4-km-long valley glacier. Three ^{14}C ages on buried tree trunks in the western (3960 m and 3820 m, asl) and eastern (3960 m asl) flanks of lateral moraines show that Ruoguo Glacier was 2 km longer than at present and was advancing into a forest at 200 BC-400 AD, 80-540 AD and 340-660 AD, respectively. This evidence suggests that the forest was covered by the advancing ice on both sides of the U-shaped valley, and a 20- to 30-cm-thick paleosoil was buried under till. A lichen date suggested that the maximum advance of Ruoguo Glacier during the LIA occurred in 1822 AD.

Zepu Glacier (3) is a valley glacier located at the headwaters of the Yarlung Tsangpo River. The glacier is 19 km long and extends from 6350 m to 3420 m from west to east-southeast in an area of 66 km^2 (Li et al., 1986). The terminal 7 km is covered with supraglacial till and has penetrated into a forested area. The detailed investigation was carried out in the glacier forefield (Iwata and Jiao, 1993; Jiao and Iwata, 1993; Jiao et al., 2005). A ^{14}C age from detrital wood buried in end moraines at Baitong, 3.5 km beyond the present glacier terminal position shows that the glacier was advancing before 650-1250 AD. A fresh terminal moraine was found in

front of a small glacier on the southern bank 4 km upstream of the present terminus. Several dead coniferous trees were found that may have been damaged by a glacier advance because their bases were buried by till. A ^{14}C age on one of the buried trees indicates that the small glacier advanced sometime during 1520-1960 AD. Another buried tree trunk was sampled in a moraine on the southern bank 1.5 km upstream from the terminus of the Zepu Glacier. The corresponding ^{14}C age also indicates an advance of Zepu Glacier during 1510-1960 AD. Additionally, a ^{14}C age for a tree trunk (Shuji Iwata, personal communication, 2006-6-26) sampled in a landslide scar formed on the terminal moraine 2 km from the present Zepu Glacier terminus was obtained. This may record an advance at 1180-1640 AD. According to the geomor-phologic setting and a ^{14}C date from charcoal found in the moraine, Jiao et al. (2005) suggested an advance from the beginning of the 1st century AD to the 5th century AD, possibly corresponding to one of the advances of Ruoguo Glacier. At that time, Zepu Glacier was 6 km longer than at present.

Bomi Glacier (4) is situated south of Bomi County. Two periods of extreme growth reductions in *Larix* trees growing on the distal slope of the terminal moraine suggest two glacier advances during the 1580-1590s and the 1860-1880s (Brauning, 2006). Arza Glacier (5), a valley glacier with a length of 16.7 km, is located in the upstream region of the Zayu River. The glacier terminus reaches down to 2400 m asl, which is more than 1800 m below the present tree line. Wang and Fan (1987) described lateral moraines of Arza Glacier dated by minimum ages of trees on the moraines, growth depressions of trees growing in the vicinity of the moraines, and ^{14}C dates on the outer portion of the buried fossil logs. A ^{14}C date on a tree branch buried in the moraine flank records an advance around 40 BC-430 AD, when the glacier was 80 m higher than the present ice surface. They also distinguish moraine stages before 1960 AD, before 1931 AD, and 1813-1852 AD.

A ^{14}C date of a tree trunk found in the lateral moraines of Laigu Glacier (6) indicates the glacier advance during the period 680-1020 AD (Zheng Benxing, personal communication, 2006-06-28). At that time the glacier was about 40 m thicker than at present (Chinese Academy of Sciences, 1996). Indications for an earlier glacier expansion during the Neoglacial period were found at Arza Glacier, where rotted wood buried in the lateral moraine was destroyed by a glacier advance around 2980± 150 ^{14}C years BR At the time 1550 BC-800 BC, the glacier was 2 km beyond the present glacier terminus and about 140 m higher than the present ice surface.

2.3 Hengduan Mountains

The Hengduan Mountains lie in the southeastern part of the Tibetan Plateau. They consist of a series of mountain ranges and rivers running north-south. From east to west, they include the Daxue Shan, the Yalong River, the Shaluli Shan, the Jinsha River, the Mangkang Shan, the Lancang River, the Nu Shan, the Nu River, and the Gaoligong Shan. Gongga Shan is located in the central area of the Daxue Shan, with the highest peak Mount Gongga (7514 m). Su and Shi (2002) state that the mean annual temperature on the eastern slope of Gongga Shan at 3000 m asl is 4 °C with an annual precipitation of 1895 mm. In contrast, on the western slope at 3700 m asl mean annual temperature and rainiall are 1.9 °C and 1174 mm, respectively. More than 80% of the total annual precipitation falls between May and September during the summer monsoon season.

Lhamcoka is a glacial lake situated in the Chola Shan (7), a mountain range running NW-SE rising to 6168 m asl of the Shaluli Shan range. Brauning and Lehmkuhl (1996) and Brauning (2006) studied glacier fluctuations by determining the ages of trees growing on glacier deposits in the forefields of the eastern and western Lhamcoka Glaciers. Ages of trees growing on the terminal moraines yield minimum ages for respective moraine formations during LIA glacier advances. Due to the position of the terminal moraines below the upper tree line and the proximity of seed-providing forests, an ecesis period of 5 years was applied to derive minimum ages (Brauning, 2006). The maximum glacier advance during the LIA occurred at about 1777-1787 AD, and stages of standstill or short re-advances occurred between 1807 and 1820 AD and the beginning of the 20th century (older than 1907 to 1920 AD).

The Gongga Mountains comprise of 5 valley glaciers with a length greater than 10 km, including Hailuogou Glacier (8), Mozigou Glacier, Yanzigou Glacier (9) and Nanmenguangou Glacier (10) on the eastern slope and Gongba Glacier (11) on the western slope. These glaciers are highly active with terminal positions extending into the forest zone at 2940 m asl (Owen et al., 2005). Hailuogou Glacier (8) is the longest monsoonal temperate glacier in the Gongga Shan. It is 13.1 km long and covers an area of 25.7 km^2. Its lower limit reaches 2980 m. Mean annual temperature and summer mean temperature at ELA (4900 m asl) are -4.4 °C and 3.6 °C, respectively.

Zheng and Ma (1994a,b), and Owen et al. (2005) noted that the Neoglacial moraine ridges rise 40-60 m above the present Hailuogou valley while the LIA moraine ridges rise 10-20 m above the present Hailuogou valley. The latter are imbedded into the Neoglacial moraines. The single lateral moraines extend several kilometers up valley from the present ice margins. According to the morphology, three distinct periods of ice margin expansion can be differentiated. From a 50-m stratigraphic section, a ^{14}C age from a tree trunk buried in glacial lake sediment intercalated between the upper and lower layers of moraines suggests that the earliest glacier advance occurred before 1520 BC-1110 BC. Another period can be traced at 340-610 AD based on the dating on buried tree trunks (Zheng Benxing, personal communication, 2006-06-28) within the upper layer of the moraine. A later advance occurred at 710-990 to 1010-1210 AD (Li et *al*, 1983; Zheng and Ma, 1994a,b; Li and Su, 1996) based on a tree trunk found beneath boulders at 2730 m asl on the distal slope of an end moraine ridge 2 km beyond the present glacier terminal position. This fossil tree was buried by an earlier debris flow or landslide (Zheng and Ma, 1994a,b). A ^{14}C date on the tree trunk gives a maximum date of 1280-1470 AD for the glacier advance. A radiocarbon date from wood between the inner side of the end moraine ridge and the lateral moraine indicates that the glacier was advancing at 1660-1960 AD. At that time the glacier was 1 km longer than at present. Hence the terminal moraine ridges are believed to have formed during the LIA between the 15th and 19th centuries. It is noteworthy that Owen et al. (2005) confirm the Neoglacial at about 1 ka and LIA (a few hundred years) based on CRN ages of the Neoglacial and LIA moraines of Zheng and Ma (1994a,b).

Yanzigou Glacier (9) is 10.5 km long and has an area of 32.15 km^2, and descends to 3680 m asl (Liu et al., 2000). Smiraglia (1997) reconstructed glacier variations in this region during the past 4000 years by studying a highly eroded inner wall of the east lateral moraine complex at about 3900 m asl. From the base to the top of the moraine complex he identified eight units with organic matter along 500-m length of the moraine. These included six shallow soil

layers with willow trunks and roots of 1-5 cm in diameter from correlative paleo-surfaces. They were interpreted as pre-existing topographic surfaces which were buried by till during glacier advances. Therefore, the ^{14}C dates from the willow trunks represent the soil and shrub burial dates and thus directly indicate the timing of glacier advances. During the last two millennia, glacier advances can be distinguished which occurred between 80-400 AD, 250-600 AD, 540-980 AD, 1460-1960 AD, and 1520-1960 AD. Additional ^{14}C dates were obtained from organic matter in peat and soils about 3920±75 (GX-17446), 2150±120 (GX-17455), and 795±60 (GX-17454) ^{14}C years BP. Smiraglia (*1997*) explained that these peats and soils were buried by later moraines when the glacier reached the more advanced lateral position to create the superposed moraines. These ^{14}C dates were derived at a high elevation of 3850-3900 m, indicating the beginning of periods of soil and peat formation and thus maximum dates of glacier advances at 2620 BC-2140 BC, 500 BC-150 AD, and 1040-1300 AD. Also they should represent relatively moderate climate conditions during the respective times.

Two kilometers farther north from the present terminal position of Nanmenguangou Glacier (10), a ^{14}C date of buried wood within the middle-upper parts of the lateral moraine shows that the glacier expanded during 1030-1400 AD. The Gongba Glacier (11), to the west of the Hailuogou Glacier, is 11 km long and has an area of 20.21 km^2, and terminates at 3930 m asl. Two ^{14}C dates from buried detrital wood (Su Zhen, personal communication, 2006-06-28J in the end moraines, which are composed granite debris suggest two distinct periods of ice margin expansion, an earlier one at 1280-1410 AD and a later one at 1400-1640 AD (Su et al., 2002).

During the last 100 years, the glaciers in the Gongga Shan have been broadly in phase during retreat. Exceptions are the two periods from the beginning of the 20th century to the 1920s, and from the middle 1960s to the early 1980s, when the glaciers were stable or even slightly advancing (Su et al., 1992; Yao et al., 2004).

2.4 Central and eastern Himalayan Mountains

The central and eastern Himalayan Mountains are situated at the southern margin of the Tibetan Plateau, extending from 81°E to 95°E. Here we discuss only variations of the monsoonal temperate glaciers of the Paohanli Mountains which trend N-S in the central Himalaya. The highest peak rises to 7218 m asl, and includes Mount Paohanli, Woguodulin and Qubixiama Glaciers. Another area of focus is the monsoonal temperate glaciers near Mount Nanjiabawa, the highest peak in the eastern Himalayan Mountains with an elevation of 7782 m asl. Since Mount Nanjiabawa is located at the very humid "Great Bend" of the Yarlung Tsangpo River, large monsoonal temperate glaciers are developed in this region. According to Zhang (1988), mean annual temperature and warm season (May-September) temperature at the equilibrium lines (at 4700 m asl) on the western slope of Mount Nanjiabawa are -4.4 °C and 2.4 °C respectively, with mean annual precipitation of 1686 mm.

Zelongnong Glacier (12), a valley glacier with a length of 10.25 km, is located on the west slope of Mount Nanjiabawa. It reaches down to 3000 m asl, which is more than 1100 m below the tree line. Two ^{14}C dates on buried trunks (Su Zhen, personal communication, 2006-06-26) in the same 150-m-thick lateral moraines on the western flank of this glacier suggest that advances occurred about 1390-1940 AD. Another ^{14}C date on buried wood found in lateral

moraines at 3600 m asl indicates a huge glacier expansion during 250-900 AD, when the Zelongnong Glacier tongue reached down valley to the Yarlung Tsangpo River and blocked the river valley (Chinese Academy of Sciences, 1996).

Gyalaperi Glacier (13) is a large valley glacier just north of the Yarlung Tsangpo River gorge. It reaches about 800 m below the alpine tree limit. According to the maximum tree ages on the lateral moraine of Gyalaperi Glacier, the maximum ice margin extent of this glacier during the LIA was reached at about 1760-1780 AD, and smaller advances occurred in 1951 and 1987 AD (Brauning, 2006).

In the central Himalayas, Li et al. (1983, 1986) determined glacier advances in the Paohanli Mountains by lichenometry. Estimated lichen ages suggest terminations of glacier advances of Mount Paohanli (14), Qubixiarna Glaciers (15) and Woguodulin (16) in 1818, 1875 and 1885 AD, respectively. On the basis of CRN dating, glacier advances around 1000 AD and the 18-19th centuries were recognized in the Garhwal Himalaya (Barnard et al., 2004b; Sharma and Owen, 1996).

2.5 Southern Himalayan Mountains

Here we confine the southern Himalayan Mountains (17-21) to the region extending between 27°54'-28°38' N, 84°-87°E where annual precipitation is dominated by the south Asian summer monsoon. The ELAs of the glaciers in this region vary between 5000 and 5600 m asl, and the glaciers belong to the monsoonal temperate type or to a cold high-alpine type (sub-maritime type according to Ageta and Kadota, 1992). In the Khumbu Himal, the mean monthly temperatures during the summer months are about 3 °C at 5000 m asl (Benn and Owen, 1998; Owen and Benn, 2005). Rothlisberger and Geyh (1985) developed a generalized curve of Holocene glacier fluctuations in the Himalayas/Kara-koram based on ^{14}C dating (mainly from the Himalayas, including the Khumbu Himal and Annapurna region) of exposed fossil soils in lateral moraines. The details for the dated material, sampling locations, and the studied glaciers were described by Rothlisberger and Geyh (1985) and Rothlisberger (1986). Lami et al. (1998) calibrated the ^{14}C dates and synthesized a chronology of glacial retreats and advances. During the last 2000 years, several glacier advances can be identified during the periods 380-600 AD, 870-1100 AD, 1250 AD, 1400-1430 AD and 1550-1850 AD. Since 1860 AD, there has been an overall retreat of almost all glaciers with limited fluctuations. Evidence from moraine OSL (Richards et al., 2000b) and CRN dates (Finkel et al., 2003) in the Khumbu Himal region confirms a glacier advance around 1000 AD.

3.0 Regional glacier variations during the last two millennia

We compiled all available evidence for glacier advances in various parts of the monsoonal temperate glacier area during the last two millennia, including ^{14}C dates derived from buried trunks in moraines and from paleosols between moraines, maximum ages of trees growing on moraines, extreme growth reductions in ring-width series, and estimated lichen dates on moraines.

At least three clear periods of glacier advance can be identified (Fig. 2): around 200-600 AD, 800-1150 AD and during 1400-1920 AD. The glacier advance around 200-600 AD was the most widespread advance of monsoonal temperate glaciers and occurred in the Hengduan

Mountains, the eastern Himalayan Mountains and the eastern Nyainqentanglha Range. The period of glacier advances and expansions in 800-1150 AD occurred both in the Hengduan Mountains and in the eastern Nyainqentanglha Range. The LIA glacier advances in 1400-1920 AD occurred generally in the monsoonal temperate glacial area, indicating broad-scale regional glacier activities. The spatial extent and timing of glacier fluctuations differ from one glacier to another. The largest glacier advance that occurred during the last two millennia dates from 800 to 1150 AD in the Gongga Shan (Li and Su, 1996), whereas in the eastern Nyainqentanglha Range, the glacier expansion during 200-600 AD was the greatest. There is ample evidence for a series of glacier advances during the period 1760-1920 AD that occurred in the area of monsoonal temperate glaciers. Especially from the beginning of the 20th century to the 1910s, and from the 1860s to the early 1880s, glaciers were advancing in each part of the southern Tibetan Plateau, as indicated by both tree ring and lichenometric data.

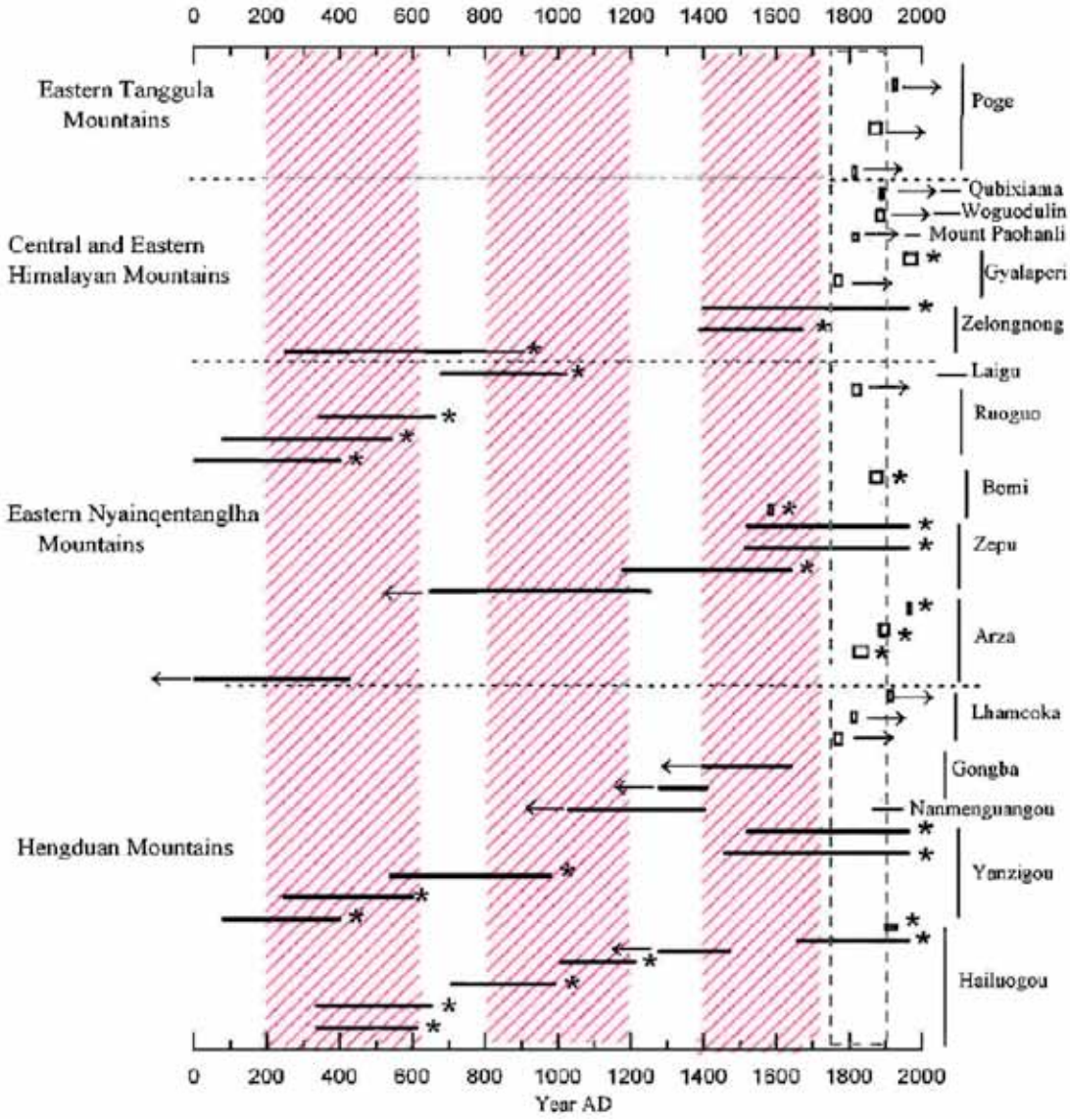

Fig.2: Calibrated radiocarbon ages of glacier advances in the monsoonal temperate glacial area. The horizontal bars are 2cr calibrated age ranges (Table 1). The squares are estimated moraine ages based on lichen growth rates and tree ring evidence. Broad shaded vertical bars indicate inferred periods of regional glacier advance. The asterisks indicate direct dates, left and right-pointing arrows represent maximum and minimum dates for glacier advances.

Table 1

Locations of glacier study sites, radiocarbon ages, tree ring evidence and estimated lichen dates

^{14}C age (±aBP) and olher type of ages	Latitude/ Longitude	No. in Fig. 1	2a Calibrated range (year AD)	Laboratory no.	Description and significance for glacier advance	Sampling altitude (m)	Reference
Eastern Tanggula Mountains							
Page Glacier	32°/95°	1					
1809, 1857-1888,1920					Lichen dates on three end moraines: minimum age	4200-4300	Li et al. (1986)
Eastern Nyainqentanzlha Mountains Rtioguo Glacier	30°18′ 940441	2					
1920±110			200 BC-400	LZ	Tree trunk toppled in lateral moraine: direct age	3960	Li et al. (1986)
1740±85			80-540	LZ	Tree trunk toppled in lateral moraine: direct age	3880	Li et al. (1986)
1540±85			340-660	LZ	Tree trunk toppled in lateral moraine: direct age	3820	Li et al. (1986)
1822 AD					Lichen dates on an end moraine: minimum age	3640	Li et al. (1986)
Zepu Glacier	30° 18′ 95°09′	3					
1056±115			650-1250	LB	Detrital wood in end moraine: maximum age	3200	Jiao et al. (2005)
580±130			1180-1640	HR-566	Tree trunk toppled in end moraine: direct age	3300	Jiao et al., 2005; Iwata and Jiao, 1993
197±80			1510-1960	LB	Tree stump toppled in end moraine: direct age	3400	Jiao et al. (2005)
190±80			1520-1960	1-16138	Fallen tree, broken by moraine deposits: direct age	2960	Jiao et al., 2005; Iwata and Jiao, 1993
Bomi Glacier	29°46′ 95°42′	4					
1580- 1590, 1860-1890					Extreme growth reductions: direct ages	4000	Brauning (2006)
Arza Glacier	29°10′ 96°48′	5					
2980±150			1550 BC-800 BC	GR	Rotten wood buried in the lateral moraines: maximum age	About 3850	Li et al. (1986)
1820±100			40 BC-430	NU	Tree branches buried in the lateral moraines: maximum age	About 3835	Wang and Fan (1987)
1813-1852, 1884-1908, 1960					Extreme growth reductions: direct ages	About 3820	Wang and Fan (1987)
Laigu Glacier	29°20′ 96°48′	6					
1150±80			680-1020	NU	Buried tree in lateral moraine: direct age or maximum age	About 4000	Wang and Fan (1987)
Hengduan Mountains							
Lhamcoka Glacier	31°49′ 99° 07′	7					
1760-1780, 1807-1820, 1907-1920					Maximum tree ages on the moraines: minimum ages	4150-4370	Brauning(2006)
Haiiuogou Glacier	29°36′ 101°57′	8					
3080±80			1520 BC-1110BC	LB	Buried tree trunk in a glacial lake depositional layer intercalated between moraines: minimum age	2980	Zheng and Ma (1994a,b)

^{14}C age (±aBP) and olher type of ages	Latitude/ Longitude	No. in Fig. 1	2a Calibrated range (year AD)	Laboratory no.	Description and significance for glacier advance	Sampling altitude (m)	Reference
1580±60			340-610	LB-	Tree trunk toppled in the lateral moraine: direct age	2750	Zheng and Ma (1994a,b)
1550±80			340-650	LB-91004	Tree trunk toppled in the lateral moraine: direct age	3000	Zheng and Ma (1994a,b)
1160±50			710-990	IB-	Tree trunk toppled in the lateral moraine: direct age	About 2900	Zheng and Ma (1994a,b)
940 ±50			1010-1210	LB	Tree trunk toppled in the lateral moraine: direct age	2930	Zheng and Ma (1994a,b)
540 ±70			1280-1470	LB-91010	Buried tree trunk by preceding debris flow or landslide: maximum age	2730	Zheng and Ma (1994a,b)
150±60			1660-1960	LB-91014	Tree trunk toppled in the lateral moraine: direct age	2850	Zheng and Ma (1994a,b)
1900-1930					Comparison of topographic maps in different stages: direct ages		Suetal. (1992)
Yanzigou Glacier	29°38′ 101°54′	9					
1785±65			80-400	GX- 17447	Willow trunk in paleosol between two tills: direct age	3850-3900	Smiraglia (1997)
1610±65			250-600	GX- 17448	Willow trunk in paleosol between two tills: direct age	3850-3900	Smiragtia (1997)
1305±110			540-980	GX- 17449	Willow trunk in paleosol between two tills: direct age	3850-3900	Smiraglia (!997)
235±110			1460-1960	GX- 17453	Willow trunk in paleosol between two tills: direct age	3850-3900	Smiwgiia (1997)
145±100			1520-1960	GX- 17452	Willow trunk in paleosol between two tills: direct age	3850-3900	Smiraglia (1997)
Nanmenguangou	29°40′ 101°59′	10					
780 ±90			1030-1400	LZ	Buried rotten wood in the till	3000	Zheng and Ma (19«a,b)
Gongba Glacier	30°30′ 101°52′	11					
620 ±40			1280-1410	LZ	Buried rotten wood in the end moraine	3700	Su el al. (2002)
440 ±50			1400-1640	LZ	Buried rotten wood in the end moraine	3900	Su el al. (2002)
Central and Eastern Himalayan Mountains							
Zelongnong Glacier	29°38′ 95°02′	12					
1481±134			250-900	LB-052	Buried tree trunk in the lateral moraine	2920	Chinese Academy of Sciences (1996)
394 ±83			1390-1670	LB-039	Buried tree trunk in the lateral moraine	2950	Chinese Academy of Sciences (1996)
287 ±93			1400-1960	LB-029	Buried tree trunk in the lateral moraine	2950	Chinese Academy of Sciences (1996)
Gyalaperi Glacier	29°54′ 94°53′	13					
1760-1780, 1951, 1987					Maximum tree ages on the moraines: minimum ages; Trees broken by moraine deposits: direct ages	3780-3820	Brauning (2006)
Mount Paohanli	28°00′	14					
Glacier	88°30′						
Qubixiama	28°00′	15					
Glacier	88°30′						
Woguodidin	28°00′	16					
Glacier	88°30′						

^{14}C age (±aBP) and olher type of ages	Latitude/ Longitude	No. in Fig. 1	2a Calibrated range (year AD)	Laboratory no.	Description and significance for glacier advance	Sampling altitude (m)	Reference
1818, 1878, 1885					Lichen dates on three end moraines:minimum age	4840	Li et al. (1986)
Southern Himalayan Mountains[a]							
Khumbu Glacier (15 dates)	27°57′ 86^{0}49′	17		HV	Humic acid and total organic content from superposed fossil soil in lateral moraine	5000-5020	(Rothlislrerger and Geyh, 19S5; Rotiitisberger, 1986)
Nuptse Glacier (4 dates)	27°56′ 86°52′	18		HV	Humic acid and total organic content from superposed fossil soil in lateral moraine	5170-5200	(Rothlisberger and Geyh, 1985; Rothlisberger, 1986)
Lhotse Nup Glacier (4 dates)	27°55′ 86°54′	19		HV	Humic acid and total organic content from superposed fossil soil in lateral moraine	5050	(Rothlisberger and Geyh, 1985; Rothlisberger, 1986)
Lhotse Shar	27°54′	20		HV	Humic acid and total organic content	5150-5170	(Rothlisberger and
Glacier (6 dates)	86°57′				from superposed fossil soil in lateral moraine		Geyh, 1985; Rothlisberger, 1986)
Gangapurna- N-	28°38′	21		HV	Humic acid and total organic content	3500-4000	(Rothlisberger and
Glacier (6 dates)	84°00′				from superposed fossil soil in lateral moraine		Geyh, 19S5; Rothlisberger, 1986)

Note: LB – Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China; GX – Krueger Enterprises Inc., Geochron Laboratories Division, in Cambridge, Massachusetts, USA; HR – Hiroshima University; I – Beta Inc. in USA.
a. *Due to the high number of individual dates, no individual ^{14}C dates are provided for space reasons.*

It is noteworthy that there is strong synchroneity between glacier variations in the monsoonal temperate glacier area and the southern Himalaya. The glacier advances during 380-600 AD, 870-1100 AD, 1400-1430 AD and 1550-1850 AD that were identified in the southern Himalaya are basically contemporaneous with those in the Gongga Shan, the eastern Himalaya, and the eastern Nyainqentanglha Range. However, possibly due to dating uncertainties, there seem to exist differences in the duration of glacier advances. As discussed above, the CRN dates suggest that the glacier advance at about 1000 AD also occurred in the central Himalaya. The synchronicity of these glacier advances over a large area points to a regional climate forcing by the SASM system. Besides the possibility of lacking fossil material for dating, this finding might emphasize the existence of local variations of forcing factors for glacier advances, such as topography or local climate. Another local phenomenon of the Khumbu Himal is a glacier advance around 1250 AD (Lami et al., 1998). However, we prefer to assign this glacier advance to the post-1400 LIA period because the ^{14}C date was derived from humic acids of a fossil soil that only gives a latest date of soil formation and thus a minimum date for the glacier advance.

In central Asia, the glaciers of the Tien Shan and Altai Mountains advanced several times during the 17-19th centuries as indicated by lichenometry (Wang, 1991; Solotnina, 1996; Solomina and Alverson, 2004J, while glacier advances in the Pamir Alay occurred in the 16-19th centuries. Two earlier glacier advances before 3215 and 1545 cal. years BP were dated by the ^{14}C ages of wood samples and lichen dates (Narama, 2002). These data are basically consistent with the glacier fluctuations on the southeastern Tibetan Plateau.

Generally, the glaciers in the Gongga Shan during the Neoglacial period were 3-9 km longer than at present, whereas the LIA glaciers were between several hundreds of meters to 3 km longer than the present ones (Su et al., 2002). Thus, the glacier advances during the LIA did not exceed those of the Neoglacial period in the Gongga Shan. Evidence of glacier advances from the eastern Nyainqentanglha Range (Wang and Fan, 1987; Jiao et al., 2005) and from the eastern Himalayan Mountains (Zhang, 1988) repeats this general pattern.

The equilibrium line altitude (ELA) variation is a good indicator of climate change determining glacier fluctuations in the case of monsoonal temperate glaciers. According to ELA variations, one can estimate temperature variations during the different periods of glacier advance. Benn and Lehmkuhl (2000) reviewed several methods commonly used for ELA reconstruction of glaciers in high-mountain environments influenced by avalanches, debris cover and topographic effects. They suggested that the toe-to-summit method of Louis (1955) can yield good results where mass-balance data are unavailable. Taking the Zepu Glacier as an example, we estimate temperature fluctuations in different periods of glacier advance during the last 2000 years. The altitudes of the terminal moraines at about 200-600 AD, 800-1150 AD, the earlier stage 1400-1650 AD of the LIA, and the 19th century are 3100 m, 3200 m, 3300 m, and 3400 m, respectively. The present glacier terminus altitude is 3420 m. The calculated corresponding ELA depressions are 160 m, 110 m, 60 m, and 10 m, respectively.

Zhang (1988) obtained the ELA depressions of 120 m and 60 m for the Neoglacial and LIA periods for the Zelongnong Glacier in the eastern Himalayan Mountains when an accumulation area ratio (AAR) value of 0.6 was chosen. At the Yanzigou Glacier in the Gongga Shan, Smiraglia (1997) estimated that the ELA depression during the phase of maximum expansion during the last 4000 years was 180m. In this case, AAR value of 0.67 was applied. In addition, Li and Su (1996) reported that the ELA depressions in Hailuogou Glacier during the Neoglacial and LIA periods were 150 m and 50 m respectively. These results are in agreement with our estimates, showing that the rise and decrease of the Zepu Glacier ELAs can be regarded as being representative for the ELA fluctuations on the southeastern Tibetan Plateau.

According to Shi et al. (1992), Kadota and Ageta (1992), Ageta and Kadota (1992), ELA variations in monsoonal temperate glacier areas are much more sensitive to summer mean temperature than to total annual precipitation. A slight temperature rise can result in a large-scale glacier retreat, and vise versa, especially for the glaciers with a summer mean temperature >2 °C at the ELA altitude (Shi, 2002). Li et al. (1986) reported that summer mean temperature at the ELA of Zepu Glacier is about 4 °C. If this decrease in altitude is attributed solely to a temperature reduction and if a thermal gradient of 0.65 °C/100 m is assumed, temperature on the southeastern Tibetan Plateau would have been lower than at present (1989 AD) by 1.0 °C, 0.7 °C, 0.4 °C and 0.1 °C during the periods of 200-600 AD, 800-1150 AD, 1400-1650 AD, and during the 19th century, respectively.

4. Discussion and conclusions

In this paper, we examine the relationship between glacier variations and climatic change in eastern High Asian mountain regions. Here we adopt the temperature reconstruction covering the last two millennia for the Tibetan Plateau, which was derived from multi-proxy data such

as tree rings, ice cores and lake sediments and represent regional-scale temperatures (Yang et al., 2003). Wang et al. (2005) presented a well-dated proxy record from a speleothem $5^{18}O$ record in Dongge Cave (25°17'N, 108°5'E, 680 rn asl) which reflects the south Asian monsoon variability. Vuille et al. (2005) stated that the $5^{18}O$ variations over the Asian monsoon domain represent fluctuations in Asian monsoon intensity and therefore are indicative of precipitation change. We compare the reconstructions of glacier fluctuations in the southeastern Tibetan Plateau and southern Himalayan Mountains with the two proxy climate records for temperature change and south Asian summer monsoon strength (Fig. 3).

If we keep dating uncertainties of ^{14}C dates of fossil material in mind, three periods of glacier advance during the last two millennia (Fig. 3) in the southeastern

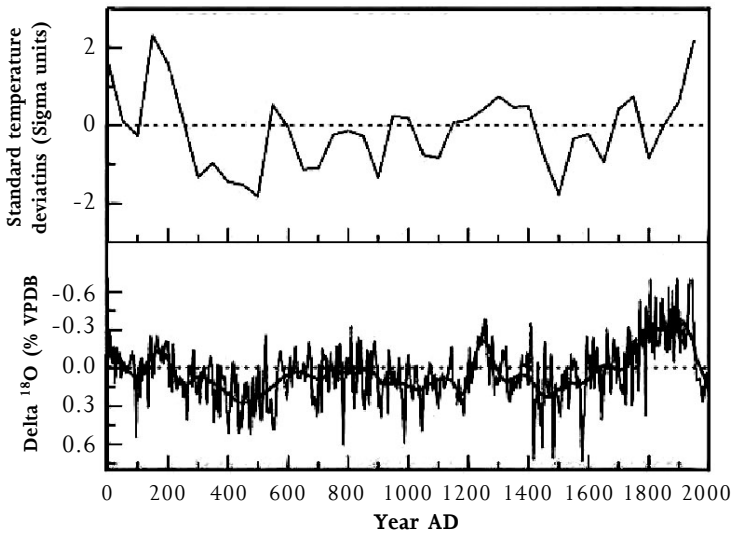

Fig.3: Comparison of the reconstruction of glacier fluctuations on the Tibetan Plateau with proxy climate records for temperature change (upper curve, after Yang et al., 2003) and south Asian summer monsoon strength (lower curve, after Wang et ah, 2005). The glacial advance record is shown by the shaded bars. The superimsmoothed curve on the speleothem $5^{18}O$ record emphasizes centennial long-term fluctuations. Broad shaded vertical bars indicate inferred periods of regional glacier advance outlined in Fig.2 The horizontal dashed lines represent the mean of the whole series.

Tibetan Plateau coincided well with cold periods indicated by the temperature curve. This leads us to conclude that on a centennial timescale glacier fluctuations in this region predominantly respond to temperature variations. In eastern Tibet, periods of glacier advances can be partly correlated with periods of reduced tree growth, corresponding to the interval of low temperature (Brauning, 2006). The glacier variations also show general agreement with the SASM variability. In most cases, phases of intensifying and weakening of the SASM correspond to phases of glacier retreats and advances in the southeast Tibetan Plateau and in the central and southern Himalayan Mountains, except for the 19th century.

The correlation of glacier fluctuations with proxy climate records suggests that temperature changes rather than SASM (precipitation) variability is the controlling factor of glacier fluctuations in this region on a centennial timescale. The role of precipitation variations on glacier fluctuations is superimposed on that of temperature change on glacier fluctuation for two reasons. First, high surface temperature during strong monsoon periods resulting from

the sensible and latent heat released by monsoon storms will cause increased glacier ablation. Second, the increase or decrease in surface temperature might result in ablation or accumulation by changing the snow/rain proportion of summer precipitation. In addition, we notice that temperature variations of the Tibetan Plateau correspond well with the SASM variability during the last 2000 years, indicating the great influence of thermal conditions in the TP on the variability of the SASM on a centennial timescale. This points to the important role that snow cover variations on the Tibetan Plateau might have played in inhibiting the formation of a strong monsoonal circulation in the subsequent summer during the last two millennia. Studies of modern observed meteorological records confirm that this relationship is also existent on annual and interannual timescales (Webster et al, 1998 and references therein).

It is exceptional that the widespread glacier expansion in the 19th century corresponded with a phase of intensive monsoon and thence high summer precipitation period, as indicated by the speleothem $\delta^{18}O$ record. A possible reason to the question lies in the nature of the glacial advance evidence. In this paper, the timing for later LIA glacier activity was primarily based on ages of living trees or lichen ages, which provide minimum ages for moraine stabilization and fall into a time when the speleothem $\delta^{18}O$ record suggests that monsoonal circulation was strengthening. The actual advance stage could predate these ages. Further investigation is required both in acquiring more precisely dated evidence for glacial advances and in understanding the climatological complexity of the speleothem $\delta^{18}O$ record of this special period.

Here it is noteworthy that an ice core net balance record from Dasuopu cap (28°N, 85°E) in the central Himalaya displays that the 19th century was the period of maximum snow accumulation during the last 600 years (Thompson et al., 2000; Duan et al., 2004), implying that the Dasuopu Glacier was also in an expansion state in the 19th century. Davis et al. (2005) examined the teleconnections between Tibetan ice cores and the North Atlantic and Asian monsoon circulation systems, and noted that the net accumulation values from the Dasuopu ice core were 30% higher than those of the north central India summer monsoon rainfall (NCISMR) during the 19th century. Since 1880 AD, the trends of the net accumulation time series and the NCISMR are similar. The increase in the net accumulation during the 19th century was possibly the result of increased winter snowfall in the central Himalayas, which might be correlated with lower temperatures in the North Atlantic (Davis et al., 2005). Therefore, besides the temperature decrease, the increase of winter snowfall was also responsible for the glacier expansion in the central Himalayas during the 19th century. To some extent, this explains why a slight temperature reduction of 0.1 °C during the 19th century corresponded with a widespread glacier advance on the southeastern Tibetan Plateau, as inferred from ELA depression of the Zepu Glacier. It can be inferred that the increased winter snowfall might have exerted some influence on the glacier advances that occurred in the southeastern Tibetan Plateau, in the central, eastern and southern Himalayas, and even in the Pamir Alay, Tien Shan and Altai Mountains.

The response pattern of glacier fluctuations to climatic change on a centennial timescale during the last two millennia seems to contradict with the hypothesis of Benn and Owen (1998). They emphasized that glacier advances culminated between 60 ka and 30 ka BP, corresponding to

enhanced summer monsoon circulation, that glacier advances during the Last Glacial Maximum were less extensive in the Karakoram and western Himalayas, and that precipitation rather than temperature change dominated glacier fluctuations over the last glacial cycle. The discrepancy might point to different responses of glaciers to climatic change on different timescales. Presently, the available absolute dates on glacier chronologies are very limited and the sparse spatial coverage of evidence of glacier fluctuations does not yet allow us to draw final conclusions about the connection between climate change and glacier behavior in this topographically and climatically complex region.

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20 Tibetan Plateau: Formation, Climate and Ecosystems

Erwin Appel & Volker Mosbrugger

Preamble

Like Antarctica and the Arctic, the Tibetan Plateau is a key area of the globe. Its formation had a profound impact on the environmental evolution at regional and global scales and until today directly influences the habitat of billions of people. Moreover, the Tibetan plateau, like the polar regions, proves to be particularly sensitive to anthropogenic Global Change. It thus deserves a major coordinated research programme which now becomes possible due to recent political developments and improved Sino-German cooperation in geoscience. The proposed priority programme **TiP** will study the Tibetan Plateau focusing on three interlinked processes, (a) plateau formation, (b) climate evolution, (c) human impact and Global Change. The key processes are analysed with respect to their impact on ecosystems on three different time scales:

- ***Plateau formation*** (uplift dynamics and related climate change) during the last millions to several tens of millions of years,
- ***Late Cenozoic climate evolution and environmental response*** during the last tens of thousands to hundreds of thousands of years with decadal to centennial resolution,
- ***Phase of human impact and Global Change*** focusing on the present stage, the past ~8000 years, and perspectives for the future.

Summary

The Tibetan Plateau is of outstanding relevance for society because it is a determining factor for the Asian monsoon system. A major part of Asia's water supply is dependent on the hydrological cycle related to the plateau. Human impacts on it may have far reaching consequences. The formation of the plateau, especially its tectonic uplift, is still an enigma in Earth science.

The priority programme **TiP** will research processes, interactions, and feedbacks of the driving forces *plateau formation - climate - human impact* and their effect on *ecosystems* on three different time scales: (1) Plateau formation and related climate change of the past ~70 million years, (2) Late Cenozoic climate evolution and environmental response during the last hundred thousand years, (3) human impact and Global Change on ecosystems during the past ~8000 years and future perspectives.

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TiP is the first concerted, multidisciplinary and holistic approach dealing with processes, interactions and feedbacks in the framework of Tibetan Plateau uplift and the related evolution of climate and ecosystems, including the impact of man.

Proposals addressing the following topics are invited:

- **Plateau formation and environmental impacts**

TiP aims to reveal the impact of plateau formation on climate and ecosystems on a time-scale of millions to several tens of millions of years. The plateau formation will be deduced from geodynamic processes and proxies of elevation history. **TiP** will use lacustrine and terrestrial archives to reconstruct the palaeo-environmental evolution and relate these results to the evolution of the plateau.

- **Late Cenozoic climate evolution and environmental response**

TiP aims to better understand the natural variability of monsoonal precipitation and melt water production. Therefore, **TiP** proposes to discern the influence of specific monsoonal air masses whose interaction causes a distinct spatial and temporal pattern of precipitation. The impact of precipitation and melt water production on sediment routing (sediment cascades) within lake catchments from different monsoonal regimes is proposed to serve for characterisation of the environmental responses to monsoon dynamics during the Late Cenozoic.

- **Phase of human impact and Global Change**

TiP aims to clarify the role of geological and anthropogenic factors for the development of the existing Earth system. **TiP** will investigate which unique regional climatic features exist at the formed plateau, and how they feed back to the global climate system. **TiP** aims to clarify if the plateau formation was driving the development of the major Tibetan ecosystems by selection of pre-existing species or displacement with invaders that were better adapted to the new environment. Finally **TiP** will investigate how the appearance of man and Global Change will affect the Tibetan ecosystem and how this might feed back to the global system.

TiP is based on a close Sino-German collaboration, systematically prepared and established during the past years. The Institute of Tibetan Plateau Research (ITP-CAS) will be the main partner institution on the Chinese side and the presented science plan was jointly developed with ITP, but cooperation with other Chinese partner institutions is also welcome.

TiP will run for six years, subdivided into two three-year-periods. Each individual proposal within TYPmust be based on interdisciplinary cooperation of at least two German Pis plus at least one Chinese PI. Joint field work campaigns will be obligatory and there will be training for young researchers for the specific requirements.

TiP promotes inter- and trans-disciplinary networking on national and international levels. Data will be provided internally and externally by a database system and via web page.

TiP will actively support and organise education of interdisciplinary working young scientists with mandatory elements of education involving also bilateral Sino-German exchange.

1. Introduction

The Tibetan Plateau, frequently referred to as the Earth's "third pole", is one of the major drivers of global climate [1-3]. With a mean altitude of ~5000 m a.s.l. and an area of more than one million km^2, it is the highest and largest plateau of the Earth. Over the past 70 million years the tectonic formation of the Tibetan Plateau has modulated the climate and switched on the monsoon system. Since its formation, the Tibetan Plateau, its vegetation, and temperature difference between plateau and ocean, represent a major controlling factor of the monsoonal climate of East Asia and Africa (Fig.1).

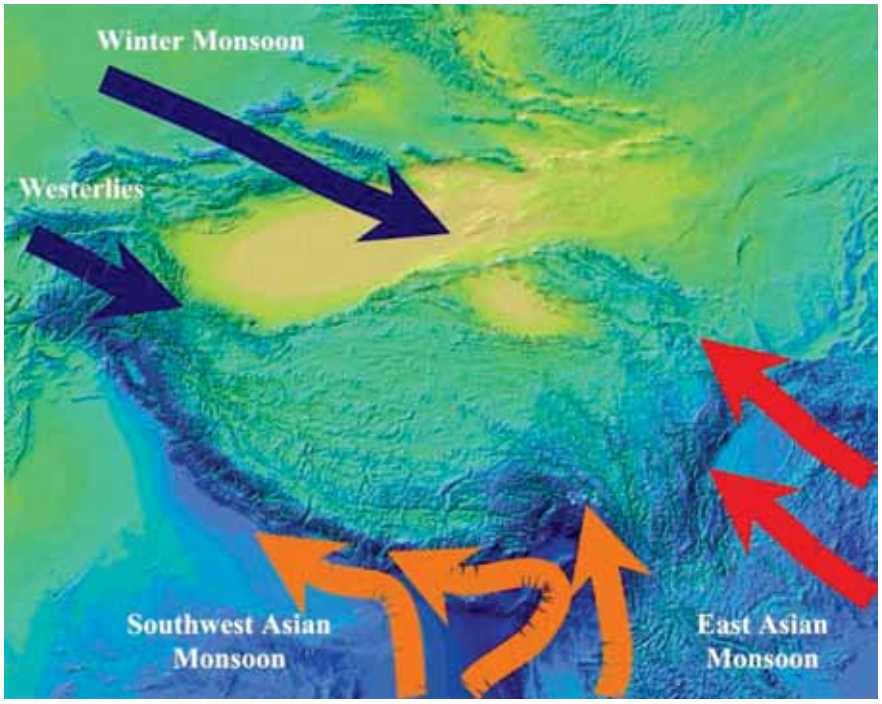


Fig.1: Scheme of the principle atmospheric circulation patterns in the area of the Tibetan Plateau.

There is also evidence for teleconnections between the Asian monsoonal system, climate oscillations in the North Atlantic, and the El Nino-Southern Oscillation during the Quaternary [4-9]. Because of its high elevation and extreme continentality, the Tibetan Plateau responds like a delicate sensor to environmental change, and this response can in turn cause drastic shifts and modifications, especially in the hydrological cycle. The sensitivity to global warming of the Tibetan Plateau, for example, is underlined by ice core data suggesting that the large-scale, plateau-wide 20th-century warming trend appears to be amplified at higher elevations [10]. This causes significant environmental changes, demonstrated for example in glacier extent, in the depth and persistence of permafrost, in vegetation cover, and in ecologic diversity. Together with the Himalayas, the Tibetan Plateau forms the headwater area of a series of major rivers, mostly fed by melt waters that provide half of humanity with water for drinking, irrigation and the production of electric power [11,12]. Similar to the polar regions, it provides high resolution archives of global and regional climate evolution, and, in addition, offers an excellent opportunity to study responses and interactions of climate and ecosystems to past and present external forcing and internal feedback mechanisms. It is thus a spectacular field laboratory

for investigating fundamental processes of geodynamics and environmental change. Particular questions of general scientific interest and global relevance include the geosphere structure and its evolution, uplift mechanisms and processes, high-resolution palaeo-environmental changes, land surface characteristics and processes, linkages between plateau uplift and atmospheric processes, evolutionary adaptation of organisms to an extreme environment, and the responses and interactions of fragile ecosystems and climate to human impacts and Global Change.

Presently, China is undergoing a tremendous economic transition with considerable effects on land-use and consequences for ecosystems and climate, also on the Tibetan Plateau. China is seeking international research collaborations, and recent relaxation in logistic and bureaucratic restrictions in access and scientific work has improved the general conditions for larger, coordinated, and interdisciplinary studies on the Tibetan Plateau.

German geoscience has a long tradition and broad expertise in research on the Tibetan Plateau. A new opportunity to integrate different research targets and to develop coordinated research programmes has opened up through the foundation of the Institute of Tibetan Plateau Research in 2003 by the Chinese Academy of Sciences (CAS) and through a memorandum signed by CAS and DFG in 2004. Within this framework, two project bundles (Bundelantrage) and three Sino-German workshops have fostered coordinated research on the Tibetan Plateau under Sino-German collaboration and thus provided milestones for the proposed "Priority Programme" *TiP*, envisaged to start in January 2008.

2. State of the art

The impact of surface uplift on climate evolution is an outstanding and crucial interaction related to the Tibetan Plateau and has led to the development of highly complex and vulnerable ecosystems. Since the appearance of man in the Neolithic, human impacts generally led to sustainable land use until recently. Today, industrial activity, global warming, and growing population impose multiple threats to Tibetan ecosystems with probably far reaching consequences. Our present knowledge of the relevant processes, their relationships and feedbacks in uplift, climate evolution, ecosystems, and human impacts is still insufficient. There are essential uncertainties in the record and process-oriented understanding of their temporal and spatial evolution. Other reasons for scarcity of data are the missing infrastructure, limited accessibility, and bureaucratic restrictions in admission of foreign scientists to the Tibetan Plateau in the past. The existing knowledge is summarised below, larger interdisciplinary, integrated, and coordinated studies are generally missing. The Chinese Academy of Science has recognised the importance of future systematic, interdisciplinary, Tibetan Plateau research, by installing the Institute of Tibetan Plateau Research (see chapter 4). It was established with consultation of DFG and MPG as the centre for scientific issues related to the Tibetan Plateau and for fostering international collaborative research programs, where Germany is considered to be a key partner.

Both, elevation and surface cover, control surface temperature and climate [13,14] and therefore have to be considered as input parameters for regional and global climate modeling. The uplift history of the Tibetan Plateau is still poorly known because direct methods to determine palaeo elevations are problematic and accordant data are very limited and contradictory [15].

Leaf physiognomies indicate that the southern plateau reached its present altitude at 15 Ma ago [16]. Based on oxygen isotope data of lacustrine and pedogenic carbonates, it has been suggested that an even earlier southern and central plateau with an elevation similar to today, possibly already existed during the Early Oligocene [17,18]. The sediment budget for the East Asian marginal seas shows sharp increases after 33 Ma and after 24-18 Ma, consistent with an early uplift [19,20].

Evidence from marine records [21-23] and a drastic increase in aridity in the Himalayan foreland [24-27] suggest that the monsoon system was established at ~8 Ma. Other authors, however, argue that a monsoon climate may have initiated at least -22 Ma [28] ago. After 8 Ma the monsoon evolution seems to have been more complex with gradual strengthening (8-6 Ma), weakening (5-3.5 Ma), further intensification (3.5-3.1 Ma), and increased variability (2.6 Ma) [29]. Later climatic events and phases may have occurred during Pleistocene times [30-34]. Over-all, there are only very few long-term records from terrestrial or lacustrine sections on the Tibetan Plateau that allow to reconstruct the evolution of climate and ecosystems, and there is a lack of satisfactory temporal and spatial resolution of data.

To understand and reconstruct uplift, knowledge of the geodynamic evolution of the India-Asia collision zone and the processes leading to plateau formation are essential. Furthermore it is a great challenge for Earth science to explain how a ~5 km high and "flat" plateau can develop and how it relates to present-day crustal movements including earthquake activity. There are controversial views on how crustal thickening and surface flattening may have occurred. Most authors accept that continental collision took place at 55-50 Ma [35,36], but others argue that the initial collision history started already earlier, at ~70 Ma [37-39]. The reduction and closure of the equatorial Tethys circumglobal current system must have led to a drastic south-westward shift of ocean currents towards higher latitudes initiating long-term global climate changes [40] and has possibly even affected the youngest Cenozoic climate evolution [41]. The palaeogeographic situation at the time of collision [42] and the time elapsed since collision are important factors for geodynamic models. Theories of plateau formation consider underplating of India beneath Tibet [43], thickening of a viscous layer and uplift by buoyancy after mantle delamination [44,45], homogeneous thickening by injection of Indian crust into a fluid-like Tibetan lower crust [46], stepwise growth of the plateau with bathtub-like filling of intermontane basins between reactivated older structures [47], mid-crustal partial melt decoupling the upper crust from the crust and mantle below [48,49], and gravitational collapse. Our present constraints on these theories are based on surface observations, the lithosphere structure obtained by geophysical studies, and deformation models. Geological evidence and GPS data show that presently a NE movement of Tibetan crust and a pronounced clockwise mass transport around the eastern Himalayan syntaxis occur [50]. Eastward movement of central Tibet may accommodate as much as ~50% of the present India-Asia convergence rate [51], and long strike-slip fault systems control a large part of this extrusion. Significant E-W extension of the crust started at least ~14 Ma ago in central Tibet [52], and minor E-W extension may have occurred since ~18 Ma [53]. It is frequently assumed that transformation from compression to extension indicates the time where the Tibetan Plateau has reached its maximum elevation [54-56], however, more recent studies

imply that such a simple relationship may not be valid [57,58]. A visco-elastic model [59] predicts extension when the Tibetan Plateau exceeded 75% of its present altitude.

The Tibetan Plateau, with its large extent and high elevation, acts as a major driving force for the present principle atmospheric circulation patterns (Fig. 1). It is located at the intersection of the Southwest Asian Monsoon and the East Asian Monsoon that bring moisture to the Tibetan Plateau during summer. During winter, the climate is controlled by the dry Asian Winter Monsoon. The Westerlies bring only little precipitation (< 50 mm) to the northernmost part of northwestern China [32].

Although there is evidence for an overall weakening of the global land monsoon precipitation during the last 56 years [60], an increase in precipitation and surface temperatures has been detected for the past decades in China and adjacent areas [61-62]. Global warming has led to a significant retreat of glaciers on the Tibetan Plateau [63] and consequently to a high production of melt water that will be followed by a decrease in water availability of 20-40 % over the next 50-100 years [64]. These changes present a major challenge for future engineering efforts and environmental protection. The shrinking of glaciers and lakes will continue and will be accompanied by a series of severe ecological changes including a decrease in total agricultural output of 10% by 2030-50, and land use change, particularly overgrazing [64] (see also chapter 3.3). Large threats to human livelihood and health, for example, could therefore be caused by unanticipated durations of extreme monsoon behaviour.

Today, strong variations in the Asian Monsoons cause flooding and crop failures that impact nearly two thirds of the world's population [65]. Failures in the summer monsoon during the past were considered to have caused, for example, the collapse of Neolithic cultures around the Central Plain of China [66]. Hsu [67] suggests that extreme drought and untimely frosts caused the famine and peasant uprising that led to the demise of the Mongols in the late 14th century and to the demise of the Ming Dynasty in the 17th century. The Tibetan Plateau is an ideal test area to study past monsoon history in order to understand the dynamics of this important component of the global climate system as well as its impact on landscape, ecosystems, and societies. Over time scales older than instrumental data, proxies from palaeoclimate archives may provide an excellent opportunity to understand the full range of monsoon variability and allow to deduce long-term climate trends. Strategically selected climate archives may be used as tools to disentangle the regional monsoon dynamics and histories through time. A major challenge for palaeoclimate research is the heterogeneity of climate information in space and time [68]. Overall, high-resolution climate proxy records from the Tibetan Plateau are scarce and of limited representativeness [69]. Ice core evidence shows that glaciation on the Tibetan Plateau occurred asynchronously and that variation in monsoonal precipitation is a stronger driver of glaciation than cooling [70]. In addition, the timing of maximum monsoonal precipitation during the Late Pleistocene and Holocene across the Tibetan Plateau gives a heterogeneous picture [71-74] and suggests that the regional expression of climate is the result of local topography, heating and uplift of air, and of the interaction between different airstreams. Since the Little Ice Age, and particularly during the 20th century, glaciers have been progressively retreating. This pattern is likely to continue throughout the 21st century, exacerbated by human-induced global warming.

Eolian mantels of silt (loess-like) on the slopes in the basins are widespread in Tibet. They are important for the environment of the Tibetan nomads (e.g. water and nutrients storage in grazing areas). Up to now there are only a few investigations regarding the distribution and timing of these eolian sifts and the dust supply on Tibet [70,75,76].

A majority of recent studies of the connection between climate change and vegetation response [77,78] use global circulation models, partially in connection with nested regional climate models. The key result from these modeling studies is that the increased heating rate of the plateau relative to the other Asian surfaces [79,80] will force an increased monsoonal precipitation transport to the plateau [81,82]. This increase in precipitation will lead to an expansion of forested biomes at the plateau [83,84]. At the same time, permafrost regions are supposed to shrink and even to disappear within the next decades [85]. On the plateau, permafrost melting will occur at the highest rates worldwide and will lead to additional trace gas emissions [86,87]. The disappearance of the permafrost regions will extend the *Kobresia* meadows available for livestock grazing. The increasing population of Tibet causes substantial overgrazing of these meadows [88] leading to the destruction of these ecosystems and desertification [89]. These processes will also cause the liberation of large amounts of carbon stored in Tibetan soils [90,91]. However, model predictions for the plateau are still not very reliable [77,92]. For a satisfactory model para mete risation, field data is clearly insufficient. Initial results exist, but not a systematic approach for the major ecosystems and on larger scales.

First experimental observations of trace gas fluxes and energy balances suggest that on the plateau special sets of parameters for plot specific measurements have to be determined [93-95]. In order to improve the model results on the regional and global scales, specific cloud parameterisation and vapour injection into the planetary boundary have to be considered [96-98].

At the ecosystem level, first results on the diversity of organisms are available for plants [99,100] and microorganisms [101-103]. However, a systematic approach that combines diversity and mitigation or adaptation strategies of organisms is still missing. Despite the fact that large amounts of soil carbon are available on the plateau [105], information on the chemistry and stability of this carbon are not available. In soil, sediment, and glaciers, particles like pollen, soot and char, or molecular markers of char [106], lignin [107] or grazing [108] could indicate human induced activities on the plateau.

3. Scientific aims and science plan

We propose to establish a multidisciplinary programme studying the processes, interactions, and feedbacks related to the tectonic formation of the Tibetan Plateau, climate and ecosystem evolution, and human impacts. To do this we will use two different approaches.

In the first approach, **TiP** will study present and past processes, interactions, and feedback mechanisms related to the systems of ***plateau formation, climate evolution, ecosystems, and human impacts*** including ***Global Change*** (Fig. 2). Deciphering the evolution and the processes within the different systems is essential to understand the feedback mechanisms between environmental factors.

In the second approach, **TiP** considers three different time scales (Fig. 3) overlapping with each other, and affecting each other from long-term to short-term. The phase of ***plateau formation*** is the longest-term scale involving the last several ten millions to millions of years during which uplift and related climate change are the outstanding research topics. Change of environmental conditions forced the development and diversification of specifically adapted ecosystems. Reconstruction of temporal and spatial uplift history requires understanding of plateau formation processes. Proxy data for palaeoelevation may contribute more direct information. The ***Late Cenozoic climate evolution and environmental response*** deals with a system where the Tibetan Plateau had approximately been at its present elevation and had reached its current spatial extent, forming boundary conditions for climate and ecosystem development. During this phase, neotectonic activity has been an important factor and monsoon dynamics developed into a significant driving force shaping the landscape especially during glacial/interglacial cycles. The third and shortest time scale is the phase of ***human impact and Global Change.*** When humans became part of the ecosystems some 8,000 years ago, a new quality of interactions and feedbacks became apparent. Understanding the human impact on the different ecosystems and on the water cycle with the potential future consequences requires knowledge on the specific evolution of the entire geo-biosphere system including humans themselves, related to all the time scales considered in *TiP*.

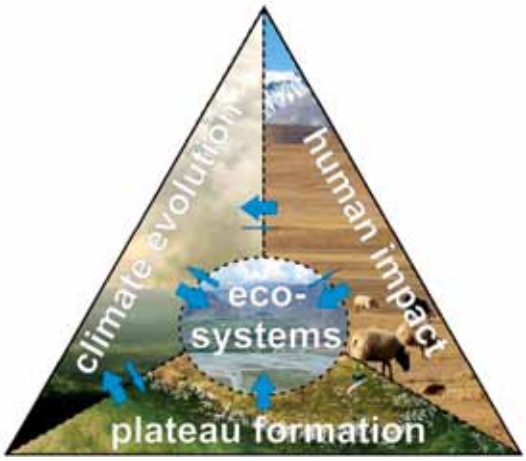


Fig.2: Interaction of the three forcing mechanisms of TiP, Plateau formation, climate evolution, human impact, and their effects on ecosystems.

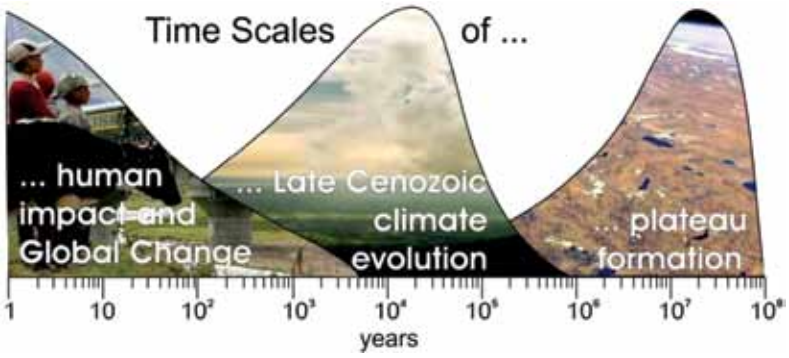
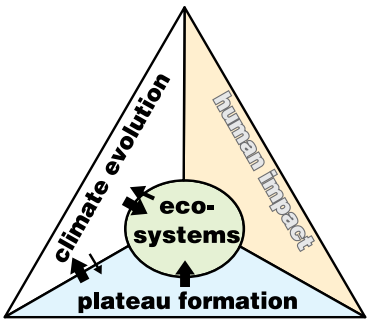


Fig.3: The three time scales of TiP; peaks characterise time periods of highest impact

The subsequent science plan is subdivided into the three time scales shown in Fig.3.

3.1 Plateau formation and environmental impacts

TiP aims to reveal the impact of plateau formation on climate and ecosystems on a time-scale of millions to several tens of millions of years. The plateau formation will be deduced from geodynamic processes and proxies of elevation history. **TiP** will use lacustrine and terrestrial archives to reconstruct the palaeo-environmental evolution and relate these results to the evolution of the plateau.



TiP aims to provide new results on the early stage of collision, post-collisional processes, and the structure of the lithosphere in order to improve the understanding of Tibetan Plateau formation. Regional, spatio-temporal patterns of crustal structure and crustal processes, of plateau uplift, and climatic and ecosystem evolution will be resolved by field studies, distributed over the Tibetan Plateau, and modeling (Fig. 4). Multidisciplinary studies on sedimentary sections and drill cores (if available), such as long-term lacustrine sequences and terrestrial basin fills, will simultaneously serve as proxy archives for palaeoelevation, climate, and ecosystem development. Better exploitation of already studied archives (cores and sections) is strongly encouraged wherever available data and samples make such an approach promising. A major aim of **TiP** is to relate the results from reconstruction of the palaeo-environmental evolution to the geological evolution of the plateau in order to investigate the interaction between tectonics, climate and ecosystem development. The time-scale considered within **TiP** starts at the early collision phase of India and Asia. This is because certain models of uplift may be a function of the time elapsed since the crust began to thicken, and also the recent ecosystem diversity may be dependent on the entire long-term evolution (see chapter 3.3). A focus will be the period for which most existing theories and models predict strongest impact of uplift and the onset of monsoon activity (Neogene).

Knowledge of the geodynamic processes of plateau formation and of the present lithosphere structure is a key to understand uplift. Geophysical results from seismology, magneto-tellurics, and heat flow, are basic data to reveal the deep structure below the plateau. The crustal structure and crustal movements can be studied by geologic and petrologic field and laboratory data, geochronology, sedimentology, palaeomagnetism, remote sensing, and geodynamic modeling. Studies of more direct uplift indicators, i.e. proxies for palaeoelevation (such as plant morphology and oxygen isotopes) as well as near-surface exhumation rates (based on low-temperature geochronology and cosmogenic nuclides) are also envisaged. Studies of **TiP** on plateau formation will contribute to the presently very active international research on this topic.

Individual proposals within **TiP** shall deal with the following questions:

1. What is the importance of the ***early phase of India-Asia collision*** for models of plateau formation and / or for the evolution of climate and ecosystems?

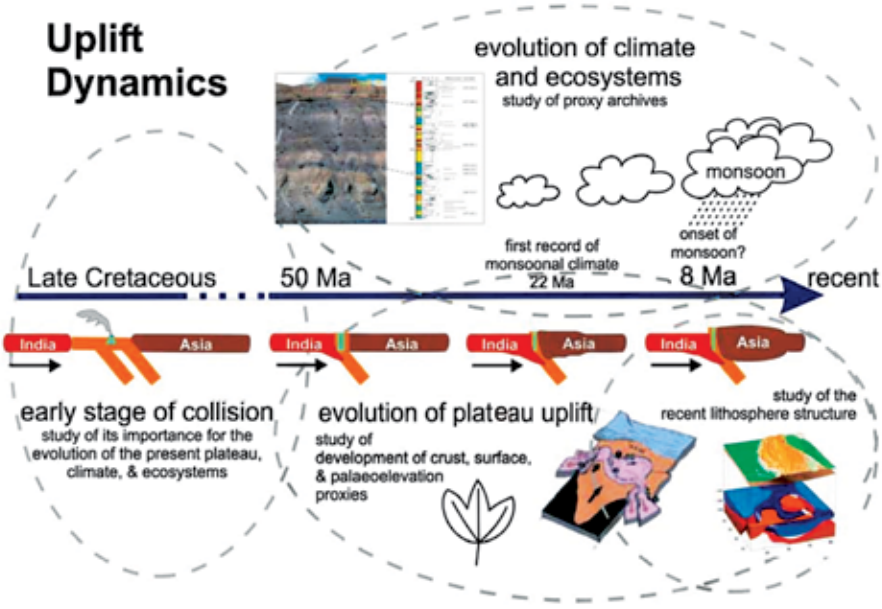
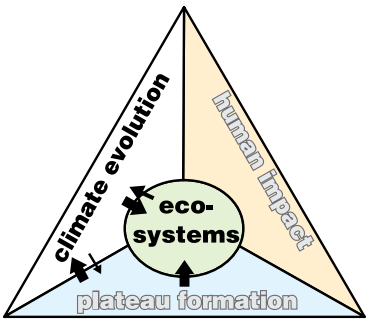


Fig.4: The phase of plateau formation and study topics within TiP.

2. Which are the important ***post-collisional crustal processes*** for lateral and vertical mass transfer in the geological past and at present, including the role of erosion and basin formation? How can these processes be quantified?
3. What are the constraints of the ***lithosphere structure,*** revealed by geophysical methods and from fingerprints at surface, for the formation of the plateau?
4. Is it possible to use plant fossils, oxygen isotopes of carbonates, near-surface exhumation rates or other approaches in order to determine ***palaeoelevation?***
5. What is the history of ***long-term evolution of climate and ecosystems*** (deduced from proxy records of lacustrine and terrestrial archives) and how can we ***relate climate/ecosystem evolution to the plateau formation?***

3.2 Late Cenozoic climate evolution and environmental response

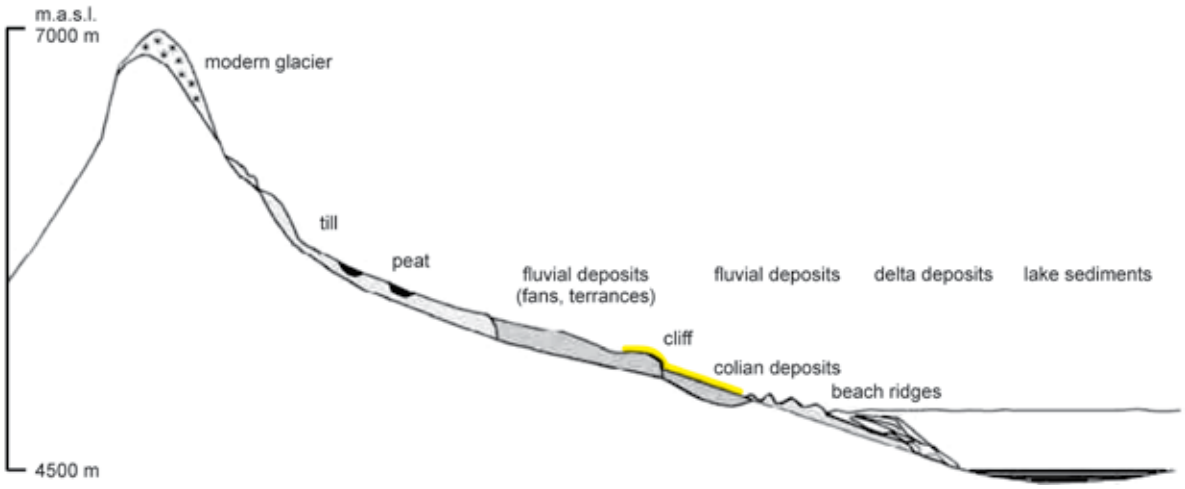
TiP aims to better understand the natural variability of monsoonal precipitation and melt water production. Therefore, **TiP** proposes to discern the influence of specific monsoonal air masses whose interaction causes a distinct spatial and temporal pattern of precipitation. The impact of precipitation and melt water production on sediment routing (sediment cascades) within lake catchments from different monsoonal regimes is proposed to serve for characterisation of the environmental responses to monsoon dynamics during the Late Cenozoic.



In order to better understand the driving forces of spatial and temporal heterogeneities of precipitation, we propose to discern the relative strength and extent of penetration of monsoonal air masses across the Asian continent over time. Furthermore, the role of the Westerlies bringing moisture to the Tibetan Plateau and the interplay between monsoonal air currents and Westerlies shall be disentangled by using multi-proxy information from climate archives. These may include, among others, tree rings, ice cores and archives from sediment cascades within lake catchments located in different monsoonal regimes. In general, lake sediments yield a wealth of multi-proxy information. Their high and continuous sedimentation rates, good age control and quick response to environmental changes provide an excellent archive of regional climate patterns and human activities. Lake sediments are, however, the final members in the sequence of the sediment cascade in a catchment. Thus, there is a need to integrate research on the entire sediment cascade including, for example, fans, terraces, colluvial, aeolian and lake deposits (Fig. 5). This will allow the integration of environmental information from the mostly undisturbed and continuously deposited lake sediments with fluvial deposits that provide a more detailed view on process dynamics and magnitudes. For example, estimates of magnitude and frequency of flood events can only be achieved by an integrated analysis of lacustrine and fluvial deposits of tributaries. Fluvial deposits are influenced by a broad spectrum of geomorphological processes that can intensify or decrease fluvial activity. Both, fluvial and lacustrine sedimentation rates, for example, can be modified by glacial and periglacial processes. In addition, eolian sediments may serve as indicators for a drier climate and human impact. They also provide excellent archives for absolute dating of phases of enhanced geomorphological activity.

Approach to Late Cenozoic Climate Evolution

Studying the sediment cascades of Tibetan lake Systems



Water Cas Ccard	glacial ice sheet	river water			lake water
		permafrost	soil water	ground water	

Sediment Case Card	till	peat	fluvial sediments	fluvio-lacustrine sediments	lacustrine sediments
	slope deposits		eolian deposits		

Fig.5: Components of a sediment cascade of a lake system to be studied within the phase of Late Cenozoic climate evolution and environmental response.

Analytical work will provide data and environmental scenarios. Combined research from the palaeodata and climate modeling communities are needed in order to assess the impact of anticipated environmental changes as a consequence of global warming, to better understand the role of the Tibetan Plateau in climate variability and evolution for the Northern Hemisphere. Thus the compilation of palaeoclimate proxy data, in-situ and remote sensing, and modeling of local and large scale atmospheric circulation will serve as a basis for a calibrated model system ranging from local to global scale. This model system will be used to address important issues of future climate development as well as to interpret climate change patterns in the recent and distant past.

Individual proposals within TiP shall deal with the following questions:

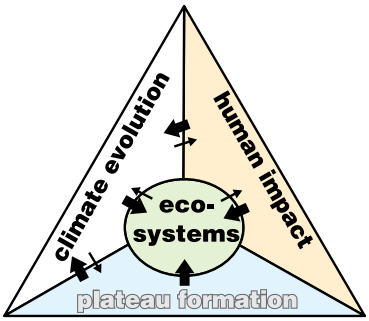
1. What is the ***natural variability of precipitation and melt water production*** in space and time?
2. What are the ***effects of interacting wind systems on the water balance of Tibetan lake systems*** and how have precipitation and evaporation changed during the Late Quaternary? How can different moisture sources of precipitation be identified and how have these moisture sources changed through time?
3. What is the ***regional expression of post LGM warm and cold phases*** known for Central Europe?
4. ***How can different archives within lake catchments*** (e.g. glacial, fluvial, lake and eolian deposits) ***be assigned to the sediment cascade and what information on temperature, precipitation and melt water production do they provide?*** How does this approach allow hydrological and sediment routing within lake catchments?

5. What are the ***regional and global teleconnections and responses of Tibetan Plateau climate to changes in external forcing*** (e.g. orbital, solar, volcanic, greenhouse gases)? What is the regional impact of climate changes and events on lake systems? To what extent do lake deposits reflect changes in magnitude and frequency of precipitation and temperature?

3.3 Phase of human impact and Global Change

TiP aims to clarify the role of geological and anthropogenic factors for the development of the existing Earth system. **TiP** will investigate which unique regional climatic features exist at the formed plateau, and how they feed back to the global climate system. **TiP** aims to clarify if the plateau formation was driving the development of the major Tibetan ecosystems by selection of pre-existing species or displacement with invaders that were better adapted to the new environment. Finally **TiP** will investigate how the appearance of man and Global Change will affect the Tibetan ecosystem and how this might feed back to the global system.

In the human impact phase, **TiP** aims to improve our current knowledge on Tibetan ecosystems and the regional climate system using systematic and integrative approaches. Both, observations and manipulations, will be performed to yield consistent data sets improving current model parameter is at ions. Corresponding measurements are a prerequisite to predict the impact of humans and climate change on the Tibetan ecosystems and to determine the feedbacks to the global climate system.



Observations shall focus on permafrost regions, *Kobresia* pastures and forests using ecosystem- and organism-based approaches (Fig. 6). For the ecosystem-based approach **TiP** will determine the pools and fluxes of carbon, nutrients including sedimentary material and water on the scale of landscapes or watersheds by remote sensing, eddy covariance flux measurements and ground-based measurements. This approach will develop tools to investigate the distribution of Tibetan ecosystems and to investigate the effects of permafrost melting or decertification resulting from human induced activities like overgrazing or logging.

Integrated Study on Ecosystems, Climate, and Human Impact

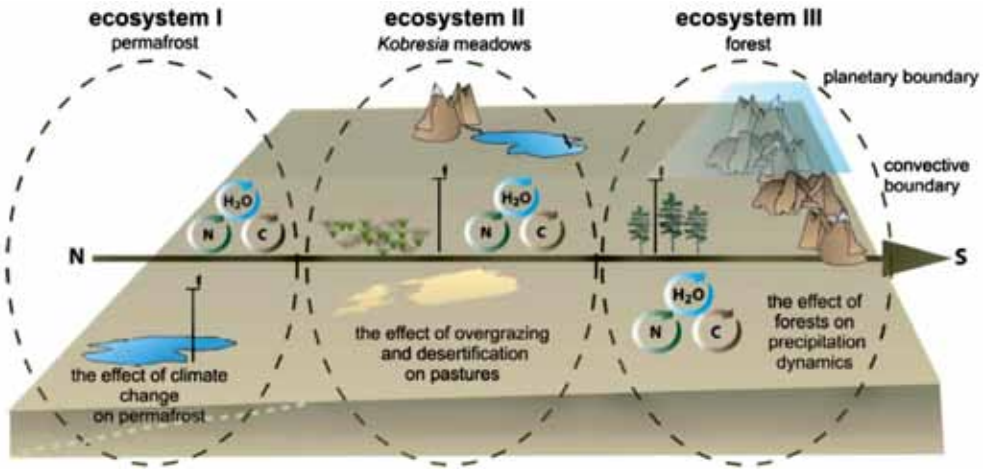


Fig.6: Landscape based flux studies in key ecosystems on a north south gradient of the plateau, and human induced disturbances.

The organism-based approach aims to clarify if the diversity hotspot in the south-eastern plateau originates from retreat of species from the plateau during cold climate episodes. Comparison of phenotypic and molecular markers like DMA, RNA sequencing, metagenomics or molecular clock approaches, will identify the diversity of resident organisms like soil micro-organisms and migrating plant or animal species. This will enable us to construct migration patterns of different groups of organisms. Additionally, **TiP** aims to identify physiological adaptation processes of resident organisms which is necessary to improve model parameterisation. **TiP** will use stable isotope for process integration necessary to evaluate model assumptions and palaeoclimate reconstructions. Consequently, isotope fractionation factors for ^{13}C, ^{18}O and ^{2}H and transfer functions valid for the plateau have to be determined.

The analysis of the geographical distribution of genetic variation using molecular tools (phylogeography) of selected plant species in combination with geomorphological and palaeoclimatic evidence will allow to identify the geographical location of glacial refugia and paths of postglacial (re-)colonization of the study area. Molecular phylogenetic analyses including a molecular clock approach will allow to identify the role of Quaternary climatic changes in plant diversification (as clearly demonstrated for European high mountain areas).

TiP suggests manipulating the *Kobresia* pastures by fencing and systematic grazing on the plot level to determine the effect of overgrazing on pools and fluxes of carbon, nutrients and water on the plot size. Pulse labelling at permafrost and desert margins and pasture sites could help to detect changes in the above- and below ground food web structure and to determine changes in the organism interactions at these sites. These manipulations at transient ecosystems will give necessary information to estimate the effect of humans and climate change on the Tibetan ecosystems.

TiP will evaluate hierarchical datasets provided from climate reconstructions, in situ measurements, and remote sensing to improve model parameterisation for regional and global climate simulations. **TiP** will perform systematic in situ measurements of energy and heat budget including hydrology fluxes for the main Tibetan ecotypes in order to close existing data gaps. Additionally **TiP** will determine meteorological data and trace gas concentrations and aerosols in the stable planetary boundary layer in order to evaluate the regional flux models and to understand the effect of vapour injections for the global circulation. **TiP** will implement the isofluxes of ^{18}O and ^{2}H in the regional and global climate simulation in order to scale between the recent climate processes and palaeoclimate proxy data derived from lake sediments or glaciers (see 3.2) and to evaluate the quality of model simulations.

To predict the impact of changing climate and humans on the existing ecosystems **TiP** suggests model investigations and observation. **TiP** will use the improved models and tools developed from ecosystem and climate observations and manipulations in combination with palaeo-information from 3.2 to make predictions on the ecosystem development and on their feedbacks to the global climate. **TiP** will focus on regional and global feedbacks derived from processes like permafrost melting, desertification, reforestation/deforestation or pollution with nutrient on the Tibetan Plateau.

To evaluate the impact of humans on the regional climate system and their feedback to the global climate system **TiP** will use climate archives like glaciers, sediments and soils to identify

particulate or molecular process markers that can reconstruct the palaeoenvironment or human induced processes like logging or grazing.

Individual proposals within **TiP** shall deal with the following questions:

1. Which are the ***key characteristics of the major Tibetan ecosystems?*** How is the development of ecosystems influenced by the formation and uplift of the plateau?
2. ***Did the uplift and plateau formation create an environment of global climatic importance?*** Which are the unique climatic factors of the Tibetan Plateau that determine significance for global climate?
3. ***How will global change,*** especially climate and human activity, ***impact the Tibetan ecosystems and feed back to the global climate?*** Which are the consequences for humans on the Tibetan Plateau?

How TiP evolved

- In August 2002, an international workshop (with German participation) was held in Beijing on principles of a future Institute of Tibetan Plateau Research (ITP).
- In December 2003, ITP was established by the Chinese Academy of Sciences (CAS).
- In May 2004, a memorandum of cooperation between ITP/CAS and DFG was signed (by the vice-presidents of CAS and DFG, Profs. Zhu Chen and Eigenberger) manifesting the joint implementation of research programmes on climate change, geodynamics and ecology of the Tibetan Plateau.
- In August 2004, the 1st Sino-German workshop was held in Beijing planning joint research projects of ITP and German research groups.
- In February 2005, a first German project bundle was submitted to DFG (approved in August 2005).
- In August 2005, the 2nd Sino-German workshop was held in Beijing and Lhasa (attended by the DFG president Prof. Winnacker), and a contract on cooperation principles between DFG and ITP was ratified.
- In August/September 2005, first Sino-German field work campaigns were conducted.
- In January 2005, a second German project bundle was submitted to DFG (approved in July 2005).
- In April 2006, the 3rd Sino-German workshop was held in Ettal/Germany deciding on the future long-term cooperation plan (attended by the DFG vice-president Prof. Steglich).
- In May 2006: DFG-round table discussion "*interactions of biosphere and atmosphere related to the Tibetan Plateau*".
- In November 2006, the proposal for the priority programme **TiP** was submitted.

4. Implementation of the programme

The Tibetan Plateau is of particular relevance for Society and Earth Sciences for the following reasons:

- it is a determining factor for the Asian monsoon system and shows presently an amplified response to global warming,

- a major part of Asia's water supply is dependent on the hydrological cycle related to the plateau and human impacts on it may have far ranging consequences,
- the geological formation of the plateau formation, especially its uplift, is still an enigma.

Presently, China experiences a tremendous economic development leading to more intensive land-use, affecting climate, and changing habitats of ecosystems, especially on the Tibetan Plateau. China is seeking international research collaborations and recent relaxation in logistic and bureaucratic restrictions in access and scientific work will strongly activate Tibetan Plateau research.

During recent years, China and Germany have established close cooperation and bilateral research projects on various aspects of Tibetan Plateau research. The DFG, together with the CAS and other Chinese institutions, has systematically prepared the framework for future collaborative research projects and among others, the authors of this proposal have successfully tested this collaboration, together with their Chinese project partners, within two bundle projects since 2005. The proposed priority programme **TiP** is the consequential continuation of the Sino-German research policy.

4.1 Novelty

Tackling interactions and feedbacks between tectonics, climate, ecosystems, and man within one interdisciplinary programme is a new approach in Tibetan Plateau research. Previous studies have focused on sectoral issues, an in-depth system understanding of the evolution of the Tibetan Plateau across time scales and disciplines has not yet been evolved or even been addressed.

Why should the priority programme TiP be implemented and why should it be implemented now?

- The Tibetan Plateau is a key area of Earth system dynamics. However, we still lack a process-based quantitative understanding of the formation of the plateau, its impacts on the biosphere, and on the atmospheric circulation in the past and present.
- For the first time, technical and methodological progress in combination with recent political developments allow for the establishment of a major Sino-German research programme focusing on the Tibetan Plateau and on its role in Earth system dynamics.
- *TiP* is the first concerted, multidisciplinary and holistic approach dealing with processes, interactions and feedbacks of Tibetan Plateau uplift and the related evolution of climate and ecosystems, including the impact of man.
- A close and extensive Sino-German cooperation on Tibetan Plateau research has been systematically prepared on a long-run (see box "How **TiP** evolved"). The ITP was established with consultation of DFG and MPG for fostering international collaborative research programmes, where Germany is considered to be a key partner.
- The interdisciplinary cooperation of German researchers and research institutions has been successfully tested within two DFG project bundles (since 2005).
- The topic is presently an international competitive research field and Germany has now the chance to take a leading position.

The goal of **TiP** is to discern the role of the Tibetan Plateau as water tower for South and

East Asia as well as within the Asia-Pacific region. This demands an integrated approach and a profound understanding of the evolution of the plateau and the interplay and feedback of the three major driving forces *tectonics, climate, and man.*

TiP will provide an overall bracket for joint proposals of German and Chinese researchers. Each individual proposal must be based on interdisciplinary cooperation of at least two German Pis plus at least one Chinese PI. Joint field work campaigns will be obligatory and there will be training for young researchers for the specific requirements before starting the field campaigns. Comprehensive field work and lab management will enable the testing and development of innovative approaches and new combinations of methods.

At present, the main obstacles for scientific work on the Tibetan Plateau are being eliminated. With relaxation in bureaucratic restrictions, improved logistic infrastructure, the opening of the Chinese scientific community to international collaborations, and political support, the general framework for addressing scientific questions related to the Tibetan Plateau is better than ever before. This framework is also being improved continuously.

With the Institute of Tibetan Plateau Research as the main Chinese partner institution the pathway for successful future joint Sino-German cooperation is being prepared. By installing the proposed Priority Programme **TiP,** Germany has the chance to take an active role in Tibetan Plateau research, and getting into a leading position in an internationally competitive research field.

4.2 Multidisciplinarity and networking (national)

The proposed Priority Programme **TiP** will combine the existing knowledge of scientists from geoscience, bioscience, and atmosphere research in order to address specific questions related to the formation of the Tibetan Plateau and its effects on climate and ecosystems, at different time scales, in a holistic approach. Thus the scope of **TiP** is clearly multi-disciplinary. Ca. 70 scientists from universities and state-funded German research institutions (HGF and MPI) have shown their interest in participation. Close cooperation of these institutions will provide an easy access to major instrumentation and guarantee an efficient use. There will be a mixture of experienced Tibetan Plateau researchers, already well linked and systematically prepared by earlier projects (e.g. running DFG bundle projects) for starting a priority programme. "Newcomers" will get competent logistic support and guidance to provide best premises for starting their work under the prevailing challenging conditions.

TiP will integrate the various aspects related to the Tibetan Plateau in one comprehensive programme for the first time. The expected synergy effects have already been proved during the initial phase of the running DFG bundle projects. These projects have a preparatory character for TiP.

To emphasise and further strengthen the multidisciplinarity, proposals submitted within **TiP** must focus on integrated studies, and - on average - three PhD students, or one PhD student and one PostDoc researcher, should work closely together.

Furthermore national networking across the individual proposals and quality assurance of research and management will be supported by:

- a steering committee, consisting of members representing all major participating scientific disciplines, which will be responsible for directive decisions, actions and guidelines,
- regular workshops and meetings, partly embedded in bilateral Sino-German meetings and with other international guests (see also 4.3),
- an internet platform providing the necessary infrastructure for interdisciplinary scientific discussion and a web page jointly maintained and serving as an information source for public media,
- the use of an established database system, PANGAEA (http://www.pangaea.de), facilitating the flow of information and exchange of data.

4.3 International networking and logistics for field studies in Tibet

TiP will be based on a strong Sino-German collaboration, systematically prepared and established by various contracts (see box "How **TiP** evolved"). Recognising the particular importance of environmental issues related to the Tibetan Plateau, the Chinese Academy of Sciences in 2003 launched the Institute of Tibetan Plateau Research (ITP). The ITP will be the main partner institution on the Chinese side. The science plan presented here was jointly developed with ITP. This science plan represents both a strengthening of common research aims by combining resources and a meaningful extension of the multidisciplinary approach by complementary studies.

The ITP will provide the necessary support for field work campaigns in Tibet (permits, cars, etc). Financial regulations are issued in a contract signed in August 2005 (see box "How **TiP** evolved") and correspond to the general arrangement of DFG and NSFC. When conducting joint field campaigns both sides shall pay for their own costs.

The principles of ITP

(texts from: http://www.itpcas.ac.cn/system/english.asp)

- *"...Institute of Tibetan Plateau Research (ITP) is one of the newly established research units by new systems and modes, to meet the demands of national economic and social development and international forward scientific research..."*
- *"...ITP will develop into an institute open to researchers worldwide, and strive to become the international center of the Tibetan Plateau research..."*
- *"...center on core scientific issue of the uplift processes of the Tibetan Plateau and its impact upon climates of Asia and Northern Hemisphere, to research the geodynamics of the Tibetan Plateau, to monitor and simulate the land surface processes, to study the biogeochemicaI processes and the adaptability of species, to investigate the genetic resources in an extreme environment..."*

Besides prime collaboration with ITP, many other Chinese institutions are already involved in past and running project activities and are welcome to join individual proposals within *TiP*.

TiP will only support proposals in which a Chinese partner is involved and his/her role is clearly defined. Also the bilateral exchange of scientists, especially young scientists, is a prerequisite. This will guarantee the bilateral support and both sides will benefit from their particular instrumental facilities and expertise.

TiP together with the ITP will hold bilateral annual workshops, alternately in Germany and China. Three such workshops have already been organised (see box "How **TiP** evolved") in order to prepare the long-term joint programme; the 4th workshop is in preparation to be hold in autumn 2007. **TiP** will also promote the organisation of whole sessions during international scientific meetings co-chaired by the German and Chinese sides. Both, Germany and China, have already hosted the annual *Himalaya-Karakoram-Tibet Workshop (HKTW)*, the main international discussion forum on geology of this region (14th HKTW 1999 in Etta I/Germany, 15th HKTW in Chengdu/China), and China intends to hold it again in 2010 (25th HKTW). The German side is ready to propose hosting the HKTW in 2012. This will be then organised for the first time as a joint meeting with the 5th *Symposium of the Tibetan Plateau* (focusing on environmental research). The time and scope of this joint conference would be ideal to present the results of **TiP** *to* a large and broad scientific community in a comprehensive way.

International networking of **TiP** will furthermore enable the linking of the existing multifold international cooperation into a comprehensive programme. Thereby, new international networks can be formed. Besides numerous smaller activities existing links to other major programmes (among many other smaller cooperation) include:

- INDEPTH ("International Deep Exploration of Tibet and the Himalayas" -Geophysical/ Geological programme of US-Canada-China-Germany; exploring structure of the crust; Phases l-lll since 1992; Phase IV now running; Germans involved since beginning),
- ICDP ("Lake Qinghai Scientific Drilling Project" - northeastern margin of the Tibetan Plateau; drilling operations in summer 2005),
- NECLIME ("Neogene Climate Evolution in Eurasia" - international open network of palaeobotanists),
- DFG Graduate School 1364 Potsdam ("Shaping Earth's surface in a variable environment" - interaction of tectonics and climate and its impact on the biosphere, African-Asian monsoonal region) initiated in 2006,
- HIMPAC ("Himalayan palaeoclimate during the Quaternary - the Indian story": German/ DFG-lndian/DST; planned; workshops Nov 2005, Oct 2006),
- IODP (using marine data related to monsoon history and sediment input from the Tibetan Plateau),
- MARIS (Monsoon Asia regional integrated studies programme of the Earth System Science Partnership covering monsoon related studies on the Tibet Plateau).

4.4 Promotion of young researchers

TiP will actively support and promote the education of interdisciplinary working young scientists. Mandatory elements within the education of PhD students will be:

- All PhD positions will be open for international young researchers.
- Young researchers within interdisciplinary projects will be guided and supervised by at least two experienced scientists from different disciplines (this shall not be in conflict with institution-specific regulations).

- All PhD projects include a three to six month stay at a partner institution, preferentially with in the Sino-German collaboration framework. Interdisciplinary and international exchange will be strongly promoted. A financial support of such research stays is included in the budget.
- PhD students are obliged to take part at special educational programs (graduate courses, summer schools) Travel expenses for visiting such programmes are included in the budget.

Similarly, PostDoc positions will be announced internationally and will be open to international candidates. Obligatory guest stays at partner institutions are also foreseen for PostDocs. The interdisciplinary integration within projects shall be based on intensive collaboration and exchange on the level of project scientists (PostDocs and PhD students). Altogether, the obligatory exchange visits, participation at training, educational programmes, and conferences, shall facilitate a high quality, interdisciplinary training and education of internationally competitive young scientists.

21 Geomorphic evidence of Glaciations around Mount Kailash (Inner Kora): Implication to past climate

Navin Juyal, P.S. Thakker and Y.P. Sundriyal

Geomorphological observations of palaeoglaciation around the southern flank of Mount Kailash (Serlung Chu valley) are presented. Three distinct events of glaciation with decreasing magnitude (Kailash stage (KS)-I to KS-III) are well represented by the trails of lateral moraine. Inferred chronology of the glaciations suggests that the KS-I event pre-dates the Last Glacial Maximum (LGM), KS-II is attributed to the LGM, whereas KS-III corresponds to the early/mid-Holocene. The push moraine and the exposed glaciated bedrock proximal to the Mount Kailash are assigned to the Little Ice Age (LIA). A decrease in glacier ice volume after KS-III glaciation is attributed to the decrease in monsoon and an increase in the summer temperature after LIA.

Keywords: Geomorphic evidence, glaciations, lateral moraine, monsoon, past climate.

Glaciers are not only important geomorphic agents in shaping the landscape, but are excellent recorders of past climate. They retreat and advance in response to climatically controlled changes in accumulation and ablation[1]. One of the direct manifestations of glacier advancement is the deposition of moraines (terminal and lateral); their distribution in the valley determines the past glacial extent and can be interpreted in terms of past precipitation and temperature changes[2]. Outside the polar region, maximum concentration of glaciers is found in the Himalaya and Tibetan plateau. Studies have shown that the elevated landmass of Tibetan plateau (2.5×10^6 km^2 with an average elevation of ~4.5 km) dramatically changes the albedo of Eurasia, thereby modifying the temperature and air pressure gradients between continent and ocean, which in turn drive the summer monsoon[3]. This advection of oceanic moisture in summer is a critical factor in glacier formation[4], which moves northward from the foothill of the Himalaya to the Tibetan plateau declines sharply from south to north across the Himalaya and is low over western Tibet[5]. Variation in snow and ice across the Himalaya and Tibetan plateau is caused due to changing rainfall gradient. This is well represented by the low equilibrium line altitude (ELA) in southeastern Tibet which is ~4300 m and in western Tibet it is over 6000 m (ref. 6). ELA defines the boundary between the zone of accumulation and that of ablation. In general, southwestern Tibet which lies to the north of the Trans Himalaya is influenced by moderate summer monsoon[7,8]. Evidence from western Himalaya suggests that on millennial scales, glacial oscillations reflect that periods of positive mass balance coincide with phases of high insolation/strengthened southwest monsoon[9,10]. Therefore, palaeoglaciation study can also be used to ascertain the past climate (monsoon) variability in this ecologically sensitive terrain.

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The well-preserved moraines and valley fills that are present throughout Tibet and the bordering mountain suggest the former extent of valley glaciers in this region. Considering the sensitivity of the mountain glaciers to climate change, a systematic study of glaciogenic sediments and landforms can enable the reconstruction of the past climatic history[11]. Such studies are important because they can serve as a benchmark against which predictive models of future climate can be evaluated[10]. The purpose of the present study has been to document the glacial geomorphology and provide a broad framework of glacial history around Mount Kailash. In order to achieve the above objectives, detailed field mapping of the glaciogenic landforms was carried out using topographic maps (1 : 50,0000 scale) and satellite remote sensing data (IRS P6 LISS-IV September 2004 and IKONOS June 2009). In order to reconstruct the palaeo ELA, highest elevation of lateral moraines (emerging point) has been used[12], which was obtained using a handheld Ground Positioning System (GPS).

The study area lies in the Kailash range dominated by Kailash conglomerate (Molasses) which was deposited over the Kailash Granite[13]. It is suggested that sediments of the Kailash range (including the Kailash Mountain) were deposited during the upliftment of the Himalaya and can be considered to be the northern limit of the latter[13]. The Indus-Tsangpo Suture Zone (ITSZ) marks the collision boundary between the Indian and Tibetan plate that passes north of the Barkha Plain (BP, Figure 1). The ITSZ demarcates two contrasting topographies: (i) a low-lying BP in the south and (ii) an elevated topography that includes Mount Kailash in the north. In addition, sharp change in elevation along ITSZ is expressed by the presence of southward-trending coalescing alluvial fans east of Darchen (AF, Figure 1). Dzong Chu and Lha Chu (Chu = river) are two major rivers that circumvent the outer periphery of the Kailash mountain (Figures 1 and 2). The present study was carried out in the Serlung Chu valley (30°58'-31°05'N and 81°15'-81°20'E). The trek route for inner circumambulation (Inner Kora) follows the Serlung Chu, which is fed by two tributary streams that originate from the southeastern and southwestern hanging glaciers from Mount Kailash (Figures 1 and 2). Serlung Chu valley rises from 4700 m (north of Darchen) to > 6000 m around Kailash Mountain (Figure 2). The annual rainfall in the region is < 200 mm, which occurs during June-September, and is caused due to the summer monsoon cloud originating from the Bay of Bengal and Arabian Sea[14].

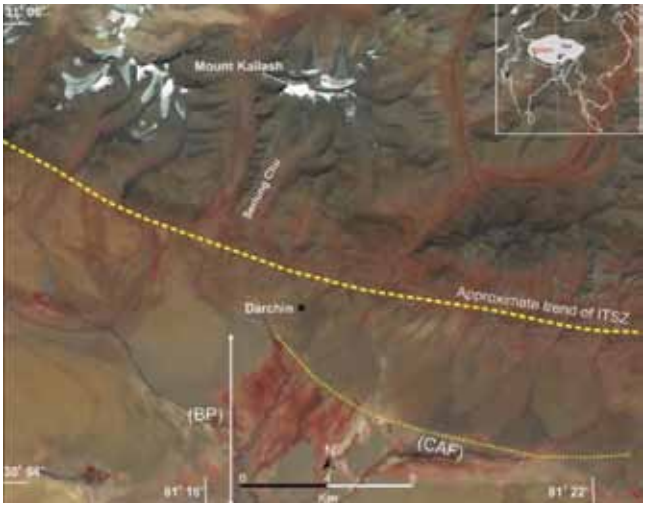

Fig.1: *September 2004 IRS P6 LISS-IV data showing various geomorphic features around the study area. The approximate trend of the Indo-Tsangpo Suture Zone (ITSZ), is also marked. BP, Barkha Plain; CAF, Coalescing alluvial fans.*

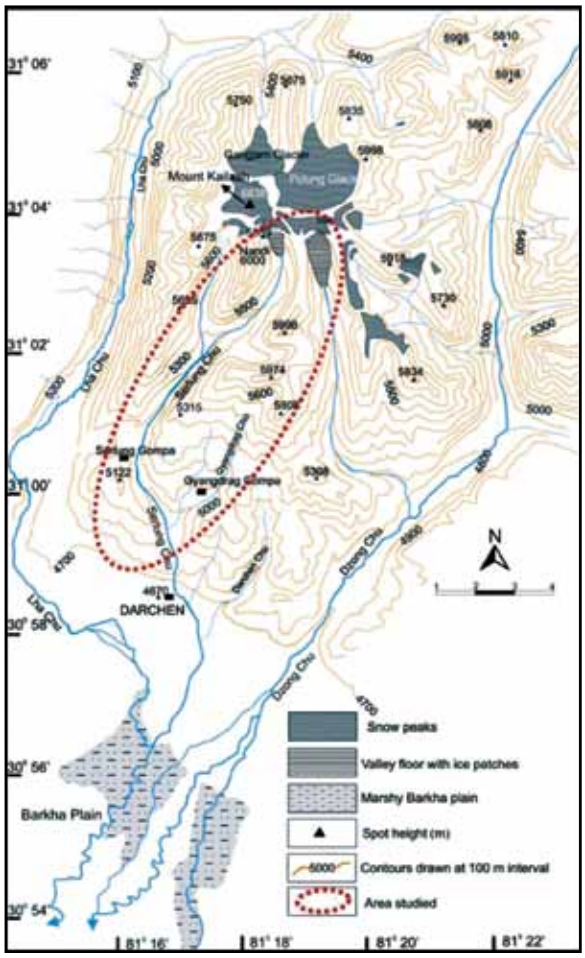

Fig.2: *Geomorphological map of the area around Mount Kailash. The study was conducted along the Serlung Chu valley (Inner Kora) marked red with a dotted ellipsoid.*

Glaciers are important geomorphic agents in shaping the landscape and are responsible for carving out some of the most spectacular geomorphic features, particularly in the Himalaya and Tibetan plateau. As the glacier ice moves it not only erodes the valley bottom, but also plucks the rocks from valley flanks. As a consequence, wide-shaped valleys are the common geomorphic expression of former grandeur of valley glaciers. Such features are quite spectacular all around the Kailash Mountain (Figure 3 *a*). One can observe at least four such valleys radiating outwards from the Kailash peak, suggesting existence of large valley glaciers in the past. One such relict glaciated valley oriented southeast is shown in Figure 3 *b*.

Evidence of the existence of extensive glaciers around Mount Kailash comes from the preservation of glacial striations observed ~ 5700m (~200m above the valley floor) and the presence of ~ 500 m long valley wide glacially polished exposed bedrock at 5500 m (Figure 3 c). These features suggest former extent of ice cover in the southern part of Mount Kailash. Glacial striations are formed by the moving ice on the rocky substratum. These are scratches and grooves formed parallel to the direction of glacier movement. Similarly, the glacially polished bedrock exposure represents former glacial substratum which is now vacated by the glacier.

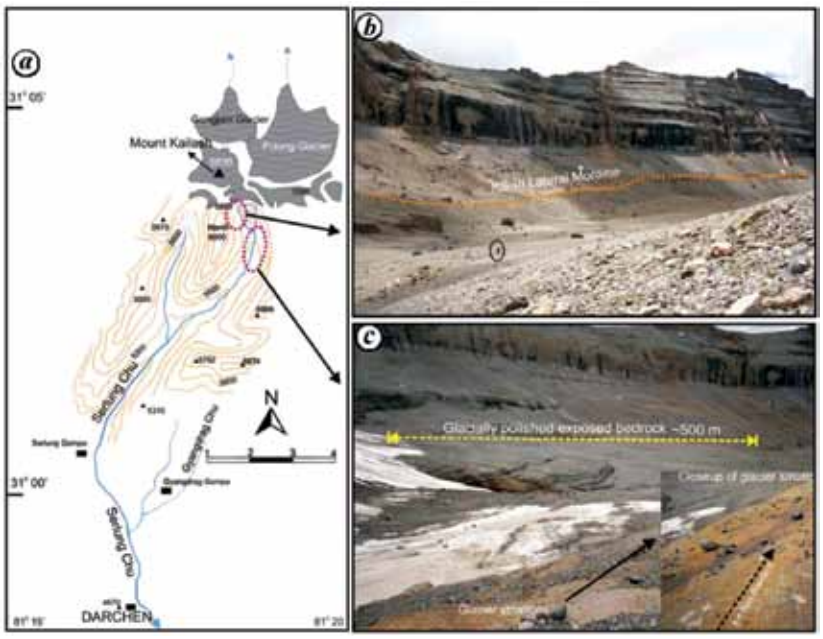

Fig.3: *(a) Map of the study area showing the location (b) left flank of the U-shaped valley carved by former glaciers, a man (circled) in the middle for scale and (c) exposed glaciated bedrock (~500 m long); terminus of the existing glacier is seen to the left as well as glacier striations proximal to the ledge connecting Mount Kailash and Nandi peak.*

Fig.4: IKONOS data showing the relict glaciated valleys and cirques (I-IV) which indicate the grandeur of glaciers around Kailash in the past.

A relict cirque is another characteristic erosional feature found in the ancient glaciated valleys. An active cirque can be considered as a feeder glacier to the main valley glacier. After the glacier recedes, a relict cirque resembles an amphitheater (Figure 4). The relationship between the modern regional snowline and the altitude of the floors of small, independent cirques in glaciated mountain ranges has long been used to provide the first-order approximation of the snowline altitude[15]. In the study area four relict cirques can be seen in the satellite data, marked as I—IV in Figure 4. The cirque floor altitude of a west-oriented relict cirque (cirque I, Figure 4) was located ~5500 m, which broadly coincides with the highest elevation of the youngest lateral moraine (discussed later), implying that the cirque was active during the youngest glacial advance.

Geomorphic expression of glacial erosion around Kailash region is manifested by the pyramidal shape Mount Kailash. Such morphology develops in areas where headward erosion of a ring of cirque glaciers around a single high mountain deepens the valley from more than three sides. The features looks like a spire of rock and are called as 'horn'. When the cirque glaciers finally disappear, they leave a steep, pyramidal mountain outlined by headwalls of the cirques[16]. This suggests that in the past glaciers around Kailash Mountain operated in a much larger scale, which led to the sculpturing of peaks and incision of deep and wide valleys.

Reconstruction based on moraine stratigraphy in areas dominated by monsoon suffers from the difficulty in differentiating the moraines from those of the frequent mass wasting[17,18]. In addition, reconstruction of the former extent of glaciers requires detailed geomorphic mapping and analyses of landforms and sediments. The most accurate methods also require that there is sufficient geomorphic evidence, usually lateral-terminal moraines and trimlines, to allow the shape of the former glacier to be reconstructed[18]. In the study area low monsoon precipitation, wide valley

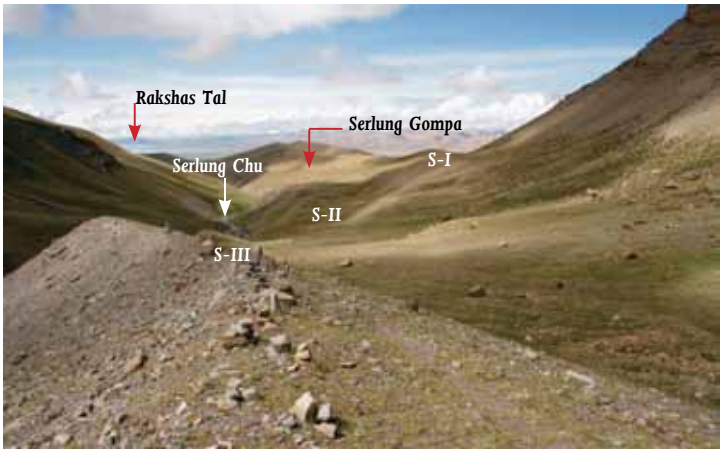

Fig.5: Field photograph of lateral moraines deposited during there major glaciations in the Serlung Chu valley (southern Kailash). These glaciations from older to younger are named as Kailash stage-I (KS-I), KS-II and KS-III.

and absence of active cirque glaciers facilitated the preservation of lateral moraines. Based on the field morpho-stratigraphic position and morphology of the lateral moraine ridges, three distinct glacial advances with progressive decrease in the magnitude have been identified in the Serlung Chu valley (Figures 5 and 6).

The degraded longest and oldest lateral moraine can be traced based on the hummocky morphology along the western flank of Serlung Chu valley. The lateral traces of this moraine ridge, at places are overlain by the debris flows and were dissected by seasonal streams (Figure 5) and named as Kailash stage-I (KS-I). The highest elevation of KS-I was located at 5200 m, whereas its terminus appeared to be around 4800 m in the vicinity of ITSZ (Figure 6). The lateral moraine associated with the second glacial advance was fluvially modified by Serlung Chu. Named as KS-II advancement, it emanates from a height of 5300 m and terminates at around 5100 m near Serlung Gompa (Figures 5 and 6). KS-II is separated from KS-I by a vertical offset of ~30 m (Figure 5). The youngest lateral moraine termed as KS-III originates from 5500 m at the base of the Kailash peak and terminates as a curvilinear ridge at 5200 m below the confluence of the tributary streams (Figure 6). In addition, the conical heap of moraines (relict push moraines) between 5500 and 5700 m (Figure 6) suggest that the glacier has receded during the post-KS-III as well.

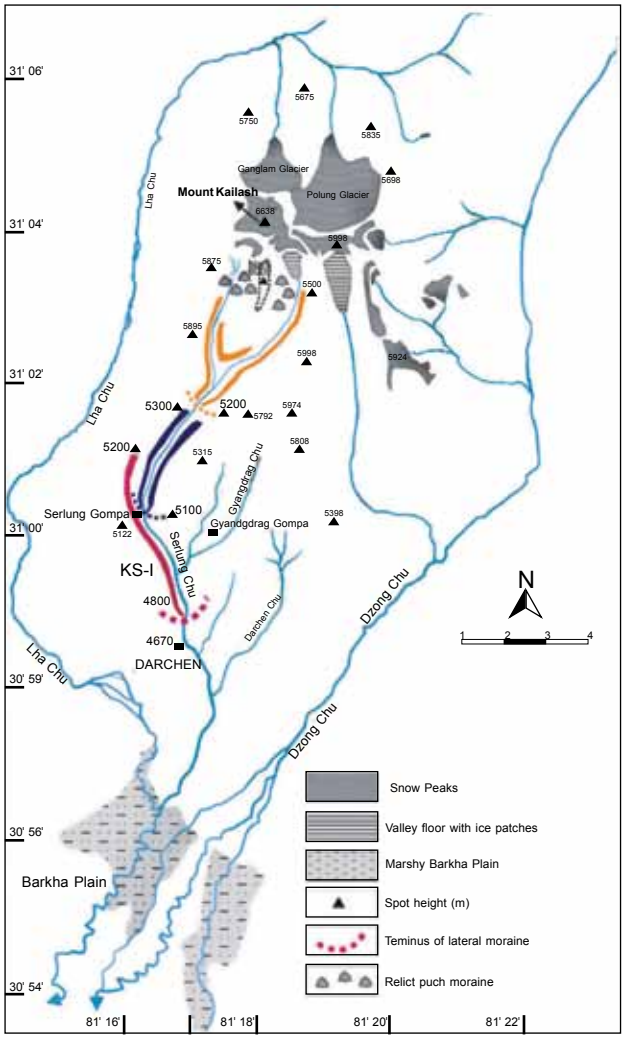

Fig.6: Geomorphological position of lateral moraines observed in the field. The emerging point of KS-1 was ~ 5200 m and termination~4700m, KS-II appeared at ~ 5300m and terminated at ~ 5100m, whereas KS-III emerged at ~ 5500m and terminated at ~ 5200m. Exposed glaciated bedrock and push moraines are also shown proximal to Mount Kailash between 5500 and 5600 m.

Glacier responds sensitively to the ambient temperature and precipitation, which in turn shift ELA. In the field, ELA is associated with the emergence of the lateral moraines[12]. Thus the magnitude of past climatic changes can be ascertained by estimating the altitudinal difference between the past and present ELAs[19]. This technique was successfully employed in the Goriganga basin (Trans Himalaya)[20], located south of Mount Kailash, to estimate past temperatures and ice volume. Although glaciers to the south of Mount Kailash have receded significantly, on the southeastern flank, a thick pile of permanent ice occupies the eastern saddle of the mountain at around 5800m. This ice cap can be assumed to be the modern ELA and compares well with the observation made by earlier workers in southwestern Tibet[6]. The saddle ice feeds the glacier below, which merely descends a few hundred meters mixed with debris (Figure 7). In order to

estimate the past temperatures associated with the individual glacial advances, ELA depression is multiplied by the adiabatic lapse rate. Lapse rate is the change in temperature as function of elevation. In southern Tibet, adiabatic lapse rate of 0.62°C/100 m has been used[21]. In the absence of any direct measurement from the study area, the above lapse rate has been used for temperature estimation. Table 1 gives the results of our preliminary temperature estimates in the valley during advancement of KS-I to KS-III glaciations.

Fig.7: Field photograph showing the southeastern face of Kailash. Note the exposed bedrock and protruding ice from the saddle. The saddle ice roughly coincides with the equilibrium line altitude (—5800 m).

Glacial stage	ELA (m)	ELA decline (m)	Temperature decline (°C)
Modern glacier	5800	_	_
KS-III	5600	200	~1
KS-II	5300	500	_ T
KS-I	5200	600	~4

Table 1. Estimation of equilibrium line altitude (ELA) depression and associated temperature change during KS-I to KS-III glaciation

The erosional and depositional landforms discussed above suggest that compared to the present, glaciers were more extensive in the past. This accords well with the suggestion that throughout Tibet and the bordering mountains, glaciers oscillated many times during the late Quaternary. It has been observed that in regions influenced by the monsoon, glaciation appears to be controlled by monsoonal precipitation which influences the glacier mass balance. This relationship allowed glaciers in high-altitude regions to advance during times of increased precipitation[22]. There appears to be a correlation between the increased precipitation and glacier advances in areas influenced by the monsoon[10,22]. The above correlation is summarized in Figure 8. Reconstruction of former extent of glaciers provides a qualitative picture of the ambient climatic condition. Such reconstruction, however, requires accurate dating of glaciogenic features and sediments for regional and global climatic correlation[18]. The present study lacks absolute ages due to paucity of organic carbon (for radiocarbon dating) and laminated sediments (for optical dating). However, it provides a broad framework of palaeoglaciation around one of the most spectacular landscapes in southwestern Tibet. In order to ascertain the tentative chronology of

different advances, we resort to circumstantial evidences, particularly the limited chronologically constrained moraines and climatic events from the region[10,23-25].

Studies in many parts of Tibet and the Himalayan regions show that glaciation was more extensive during the earlier part of the last glacial cycle and was limited in extent during the Last Glacial Maximum (LGM; Figure 8). Similarly, Holocene glacial advances were also limited in extent, with glaciers advancing just a few kilometres from their present ice margins[22]. The above inferences are based on the regional studies, viz. Ladakh to Nepal and eastern Tibetan plateau[20,23-25]. Also, if we compare the most proximal terrain, the Trans Himalayan region of Uttarakhand, chronology of relict lake sequence and moraines suggests that compared to the LGM glacier were more extensive during pre-LGM period probably correspond to the Marine Isotopic Stage-4 (MIS-4) (refs 20 and 26) or early part of MIS-3 (ref. 27). In addition, the youngest glacial advance north of Badrinath in the Alaknanda valley was dated to 4.5 ka, whereas the conical heap of moraines proximal to the present-day snout was attributed to the Little Ice Age (LIA)[28].

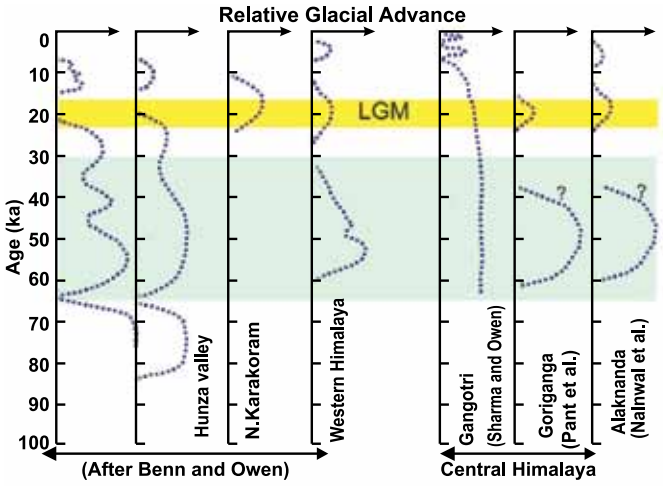

Fig.8: Chronology of Late Quaternary glaciation in the Himalaya suggests maximum valley glaciation (schematic) occurred between 60 and 30 ka (highlighted by light blue box) during the late MIS-4 and MIS-3. These periods coincide with relatively enhanced monsoon compared to the Last Glacial Maximum (LGM).

Glacial expansion is generally a response to lower temperatures, but at high altitudes it may be more sensitive to changes in moisture transport[29]. Depending upon the geographical position of glaciers in the Himalaya, both precipitation and temperature modulate the ELA position. For example, in the southern monsoon-dominated Himalaya, lowering of ELA is associated with decrease in summer temperature and increase in monsoonal precipitation. Compared to this in the drier, western and northern Central Asia, it is temperature that governs the position of ELA (ref. 1). In a broadly comparable terrain in southern Tibet (Nyalam), it was observed that during LGM (MIS-2) snowline depressed by -450 m, which translates into a temperature decline of around 3°C. Compared to this, during post-LGM (Late Glacial), snowline depression and the corresponding temperate decline were estimated to be -250 m and ~2°C respectively. It has been observed that glaciers in Tibet expanded when the melting during the ablation season was reduced by cooler summer temperature and not during periods of the increased moisture supply associated with a strengthened monsoon[21].

Since our study is limited by chronology, we ascertained the timing of individual glacial stages by comparing the ELA depression estimated from the present study with that of the climatically identical and geographically proximal Nyalam valley[21]. The timing of KS-I glaciation is uncertain. However, looking at the ELA depression of - 600 m and associated temperature decline of - 4°C, this event is likely to pre-date LGM. A comparable ELA depression (~ 500 m) and the associated temperature decline (~3°C) during KS-II advance compare well with the glacial expansion observed during LGM in Nyalam valley[21]. Whereas KS-III would correspond to the post-glacial (Holocene?) advance (ELA depression - 200 m and temperature decrease ~1°C). In addition, exposed glaciated bedrock and conical heap of moraines (Figures 3 and 6) probably correspond to recent or sub-recent increase in temperature after LIA (~ 19th century AD). Figure 9 is a pictorial depiction of the changes in ice cover since the KS-III glaciation to the Present. This depiction is based on the mapping of lateral moraines associated with KS-III glaciation and the glaciogenic features discussed earlier.

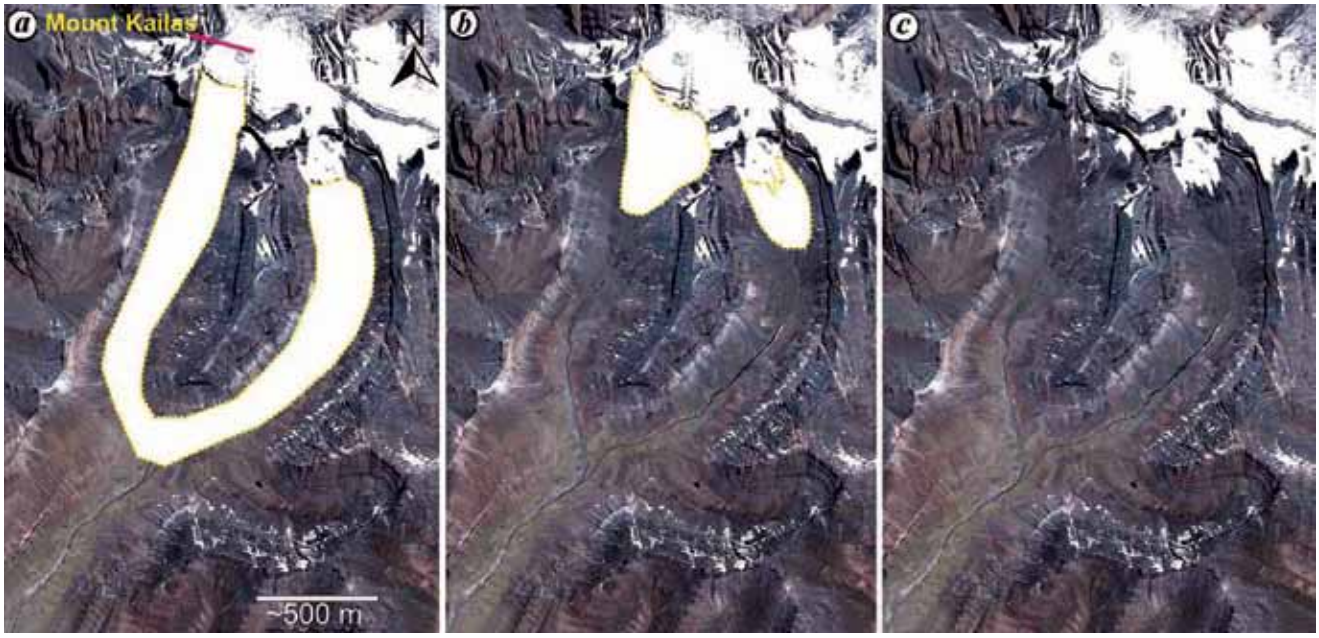

Fig.9: Glacier reconstruction based on the lateral moraine associated with KS-III glaciation, push moraine and exposed glaciated bedrock. The observations are superimposed on June 2009 IKONOS data. The reconstructed glacier extents are bordered with yellow dots. Glacier extent during (a) KS-III, (b) deposition of push moraine and glaciated bedrock development and (c) present position.

Our inferences although speculative, provide a broad framework of Late Quaternary glacier history from one of the most ecologically fragile terrains in the Himalaya. The observations presented here indicate that glaciers in southern Kailash region are on a receding trend. At this stage, it is difficult to ascertain if the recession was due to the change in precipitation or temperature. Existing climatic data suggest that compared to the early Holocene, a gradual decline in monsoon was observed in Tibet, particularly after 3 ka. However, the decrease in moisture was not all that low compared to LGM[30]. Therefore, it can be inferred that after the KS-III glaciation, there would have been a decrease in rainfall around Mount Kailash. However, considering the present-day rainfall of 200 mm, it is not all that low to cause alarming recession of the glaciers. We hypothesize that after the KS-III glaciation, a steady increase in the summer temperature with a

brief reversal during the LIA, when the marginal increase in glacier covering the exposed glacially polished bedrock and deposition of push moraines occurred. Climatic scenarios and circumstantial evidences suggest that the current recession would have occurred after LIA around the beginning of the 19th century. In the near future once the stratigraphic and geomorphic evidences presented in the present study are chronologically constrained, we would be in a better position to ascertain the climatic pattern that prevailed during the Kailash glaciation. In addition, chronology of past glaciation would possibly help in understanding the potential evolution of the glaciers around Mount Kailash in response to the anticipated global warming scenario.

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Chapter - 07

Ancient Tibet - History and Culture

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• Records of early Han history	-
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• Study of Jain and Tibetan symbols	Thomas Parmar
• Glossary of Tibetan words	-

Introduction

The Tibetan plateau has been inhabited for thousands of years but the identity of earliest people is still a mystery. The chapter includes an excellent article "Ancient Tibet" which describes in detail the formation of the plateau, geology, geography, seismic activities, climate, etc. This was a study undertaken by Yeshe De project. It also discusses history, ancient inhabitants, their culture,religion, etc.

The chapter also includes several one or two page articles where references to Rushabhdev and Jain religion are mentioned. Records of early Han and Jian history and their relationship are discussed. Dr. Thomas Parmar describes his visit to Library of Tibetan works and Archives (LTWA) in Dharamsala, H.P. where he met several Tibetan scholars and obtained research information related to Ashtapad project. Finally, a study of some symbols common in Jain and Tibetan and their significance is compared and discussed. A glossary of Tibetan words makes it easy to understand common Tibetan words, when one visits the Mt. Kailash area.

Photos about Nature's beauty-Panoramic views of landscapes around Kailash area are given here.

Nature's Beauty - Panoramic Views of Landscapes

The southeast portion of the inner Kora

Dharma King Norsang valley

A Morning View - On way to Kailash

Note the ruins of a small house constructed on top on the vertically fissured Kailash conglomerate rock. Rakshas Tal and Himalaya can be seen in the far South.

On our way back to Darchen town after the inner Kora expedition,
Barkha Plain and Trans Himalaya can be seen towards the South.

On the way to Khamdo Sanglam La (2006)

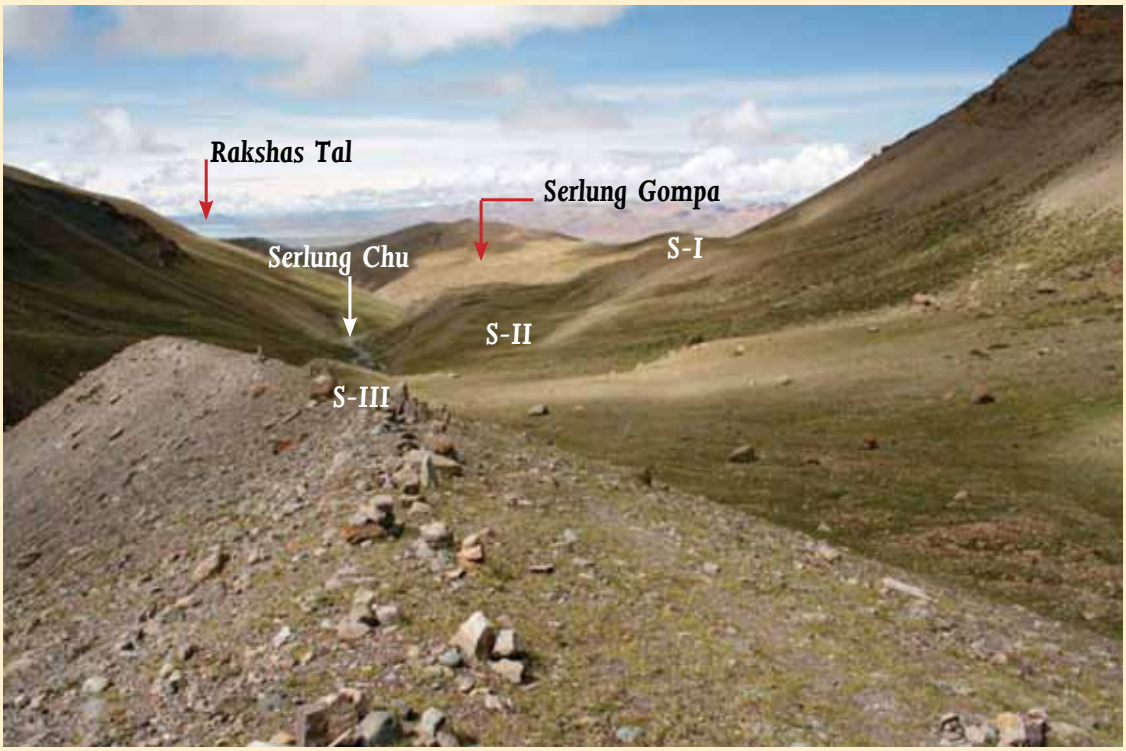
View from Khamdo Sanglam La (2006)

View from Gyangdrag Gompa looking at Rakshas Tal

A view of treeless Barkha Plain with lake from high ground

Snow - Grass - Mountain

Gyangdrag Hill



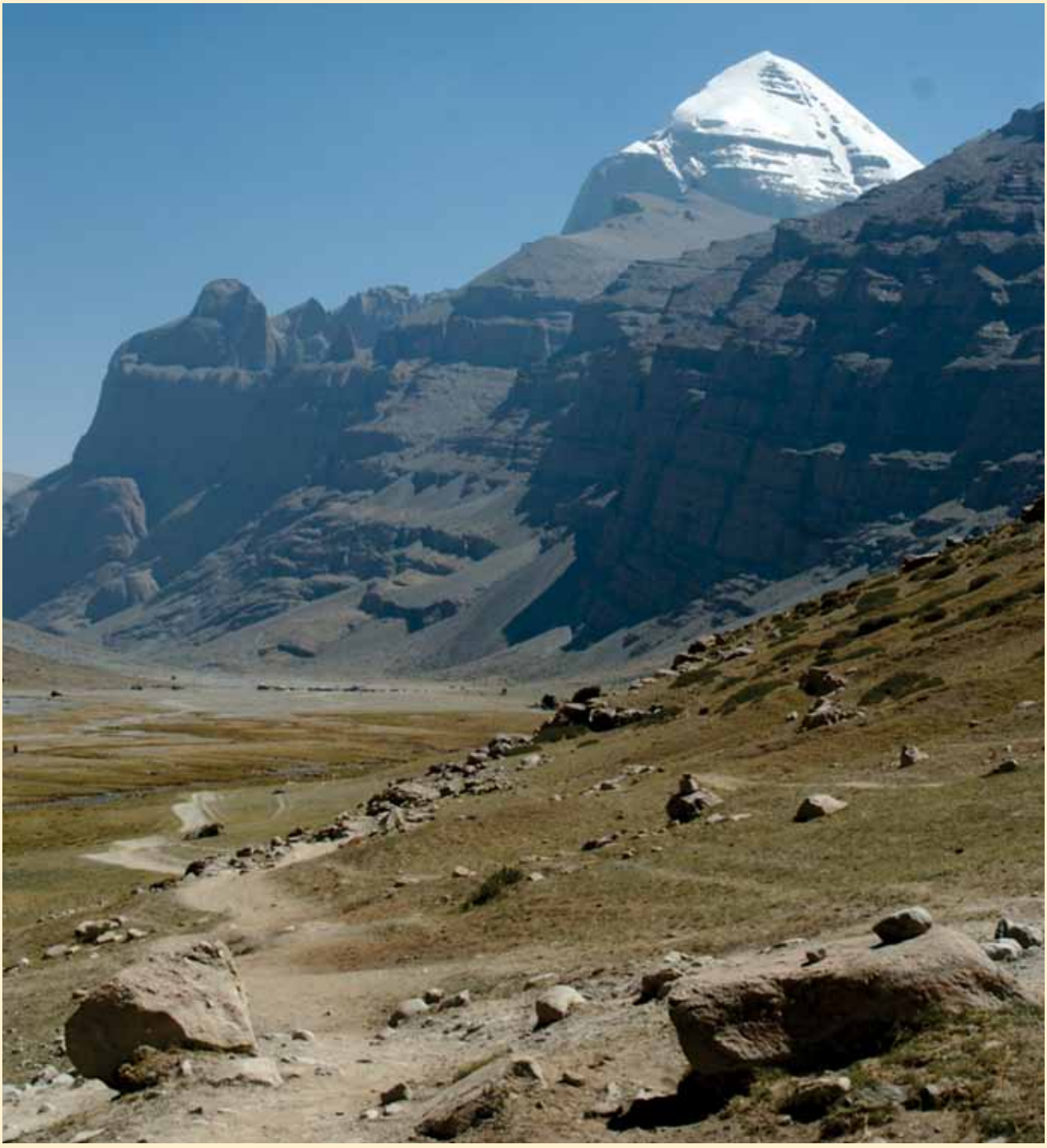
Three glacial stage, S-I (oldest) to S-III, (youngest). Note the Rakshas Tal at the far end.

Dr. Bellezza on eastern outer kora route

Gurla Mandhata and Rakshas Tal from the summit of the popularly designated Ashtapad peak

Middle Lha Chu valley from high Lungten Phuk site

Northern Lha Chu valley from high Lungten Phuk site



Southwest outer Kora Kailash

22 Ancient Tibet

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Two	Modern Landforms
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By the seventh century great kings and generals began to expand Tibetan territory beyond the plateau. An advanced civilization developed as new influences mingled with the old culture, and Buddhism became the religion of the land.

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Part One : The Land

Creation of the Tibetan Plateau

The northern parts of Tibet appear to have joined Asia earlier than southern Tibet, which belonged to the Indian plate that collided with Asia some 45 million years ago. Recent evidence indicates that Tibet's most northerly ranges are the oldest, those across the northern plain of Byang-thang are younger, those in central Tibet are younger still, and the Himalayas are the youngest of all. Such a chronological order suggests to some researchers that land was gradually added to Asia to form the Tibetan plateau, the last piece arriving with India.

These northern additions may have been blocks that broke away from Gondwanaland, islands in the Tethys Sea, or small land masses somewhere between Asia and Gondwanaland. The history of these northerly regions is still uncertain, but reports from the 1980 symposium and papers published in recent Western journals offer this interesting scenario:

About 300 million years ago, India still lay in the southern hemisphere, along the east coast of Africa. It was separated by the Tethys Sea from north China and Tarim, the block of land later to become the site of Khotan, north of Tibet. The Kun-lun range that today runs between the Tarim basin and the northern edge of the Tibetan plateau is thought to have formed by this time.

Byang-thang seems to have joined to Asia by 200 million years ago when Pangaea began to break apart. Across the northern edge of the plateau today extends a region that appears to be a connection zone along Litian and Margai Caka lakes, south of the Kokoshili mountains, and along the 'Bri-chu. About this same time, south China and Indochina were joining Asia.

Byang-thang is thought to have been connected to the land southwest of the Red river region in Indochina (northern Vietnam, Cambodia, and Laos), and these regions may have joined Asia together.

Another connection zone appears to run between Byang-thang and central Tibet, from Pang-gong lake in the far west, across Byang-thang, and along the Nag-chu river (Nu Jiang) in the east. Thus, the region of central Tibet south of the Nag-chu river and north of the gTsang-po seems to have joined Asia next. This land may also have been connected to Thailand and the Malay peninsula, and these regions may have moved together. The most recent surveys indicate that fossils south of the Nu Jiang connection zone are typical of the Indian subcontinent, sug-ftsTm; the region was associated with the Indian plate.

As south China, Indochina, Byang-thang, and central Tibet joined Asia, the series of collisions and additions began to raise northern Tibet out of the water. The Kun-luns and the region east of the 'Bri-chu rose above sea level, followed by Byang-thangnorth of Gangs-ti-se, as well as the region north and east of the Xag-chu river: the modern area of Chab-mdo, Ri-bo-che, Tsha-ba-rong, and dMar-khams. The plate motions are also thought to have produced great folding in older mountain ranges farther north, such as the Kun-luns and the Bayankara mountains.

The Birth of The Himalayas

The joining of the far southern part of Tibet to Asia is better understood, and discussions of India's northward drift can be found in encyclopedias as well as in geology texts. The 1980 symposium presented new details on this collision, giving a variety of hypotheses to explain the uplifting of the plateau.

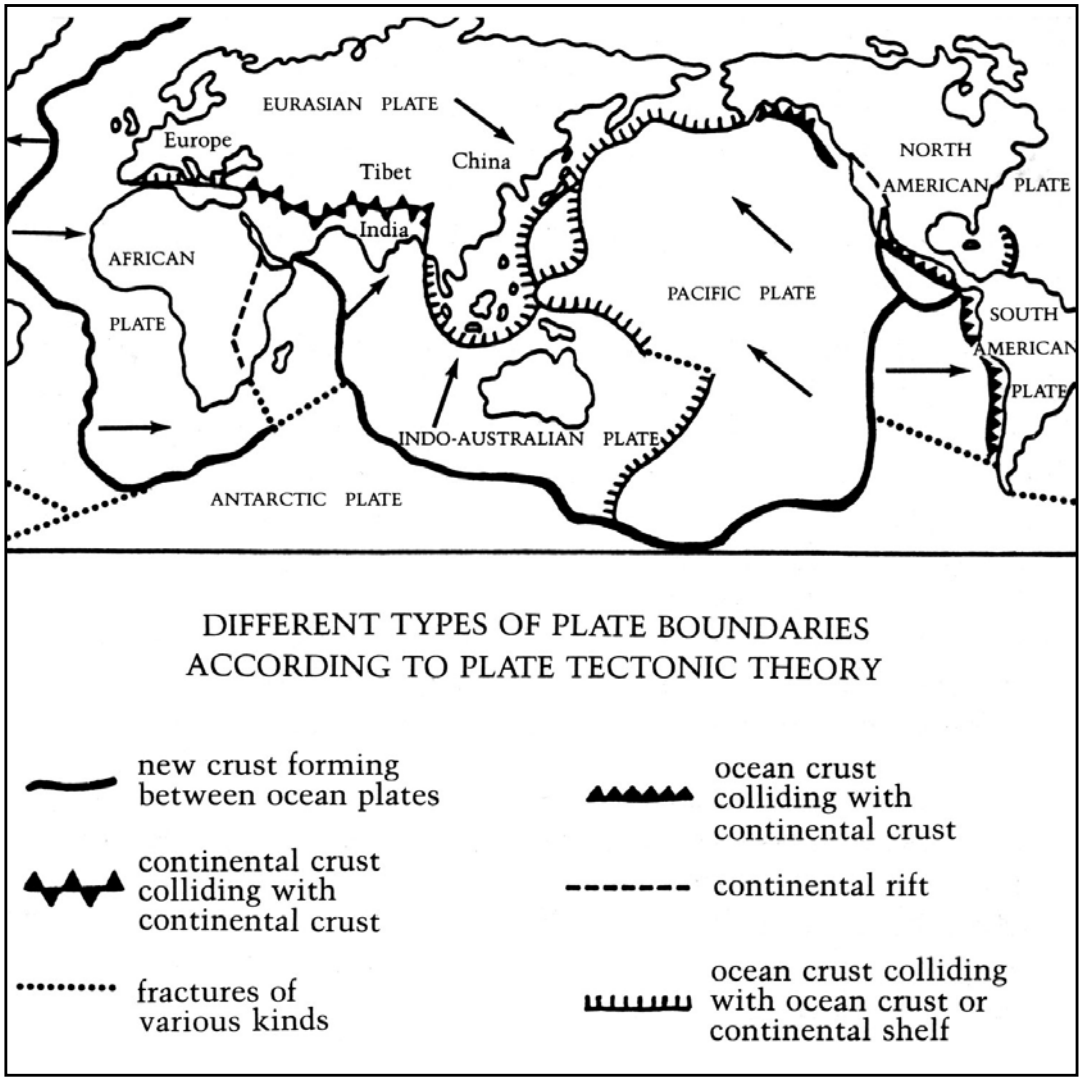
By 100 million years ago, the plate carrying India had begun to drift north from its location alongside Africa as rifts formed in Gondwanaland. This opening between India and Africa eventually became the Indian Ocean. As India moved north, ocean crust beneath the Tethys Sea was first to press against Asia. Sliding down beneath the continental land along the line now formed by the gTsang-po river, the ocean crust was remelted, and the sea began to shrink. The northward pressure and the remelting of crust created intense agitation. New volcanoes erupted in Gangs-ti-se and gNyan-chen-thang-lha, building these ranges higher. By 50 million years ago, the bulk of Mount Ti-se was built up. About this time the Rockies were forming in America and the Caucasus formed in Russia. North America was just now splitting away from Europe as the Atlantic Ocean continued to widen.

By 45-40 million years ago, the entire crust of the Tethys Sea had descended beneath the Asian continent, closing the sea completely. The Indian plate carrying southern Tibet now collided with central Tibet along the zone of today's Indus and gTsang-po rivers. As land masses met head-on, the Himalayas began rising out of the sea. The last oceanic crust and sedimentary rock overlying ocean floor, as well as volcanic islands that had formed between the plates, were compressed and squeezed into huge folds that slid south over the Indian plate. The Himalayas continued to grow by a southward extension that occurred in several stages.

As India continued to press north, the crust fractured, and about 20 million years ago, large faults developed in the new Himalayas. Along a fault 2000 kilometers long, known as the

Main Central Fault, thrusting movements pushed older rock layers up over younger layers. This great northward pressure contracted the plateau, thickening its crust, and exerted force on all the older mountains, creating more folding and thrusting these ranges up even higher. Gangs-ti-se greatly increased at this time. Volcanoes began erupting north of the collision zone, gradually forming farther and farther north, until they arose along the Kun-lun mountains. This series of volcanoes, which are now extinct, can be seen south of Muztagh Ata peak in the Kun-luns and south of Margai Caka salt lake in Byang-thang.

Tectonic Plates of The World



Recent geological discoveries indicate that the surface of the earth is divided into a number of separate plates that change positions, floating on top of the deeper deformable layers of the planet. The movements of these plates are thought to have created the mountains and oceans, while constantly shifting the position of the land. The modern arrangement of land is less than 100 million years old and is continuing to change as the plates move at the rate of two to eight centimeters per year (two to eight meters per century).

Sea Floor Spreading

When a rift occurs in a plate carrying ocean floor, lava from the mantle rises up and hardens into new crust. Thus over time the sea floor spreads as new crust is created at the rift. The rock of this new crust takes on the characteristic magnetic polarity of the earth at the time of the rock's formation. Because this polarity shifts over time, bands of alternating polarity form on either side of the rift. This deep-sea record allows the dating of the ocean floor.

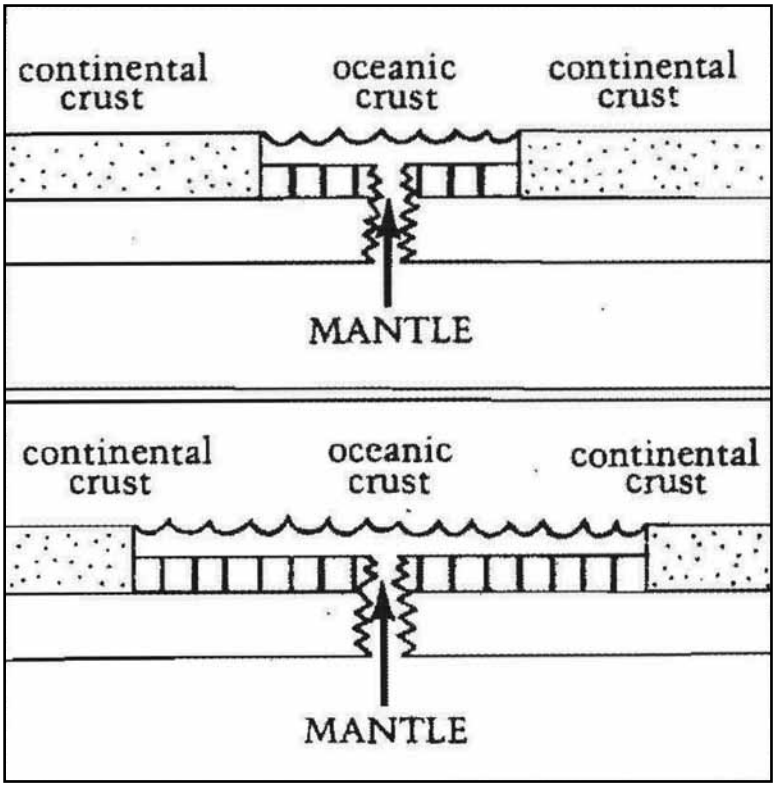
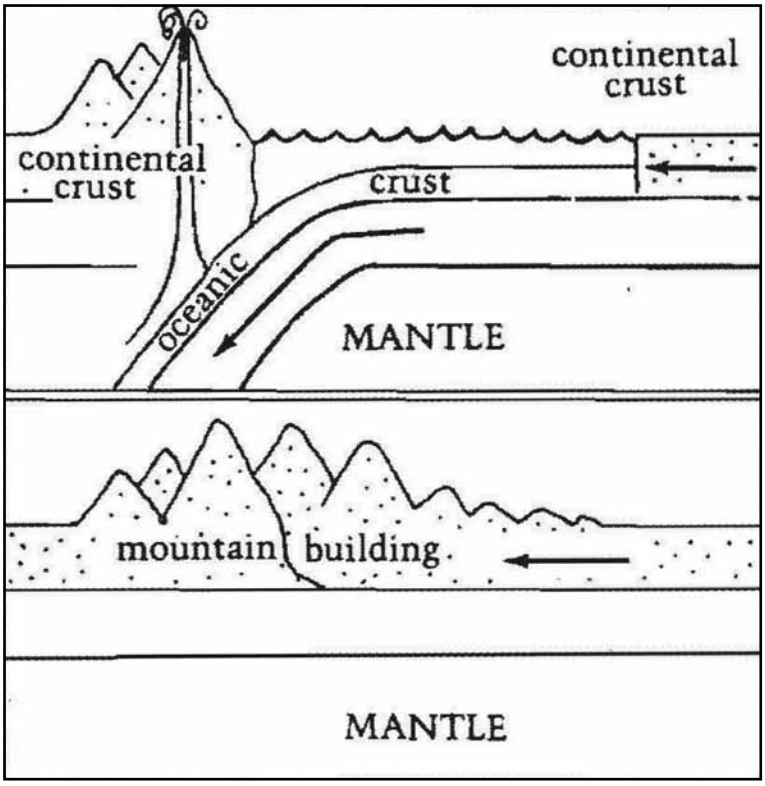


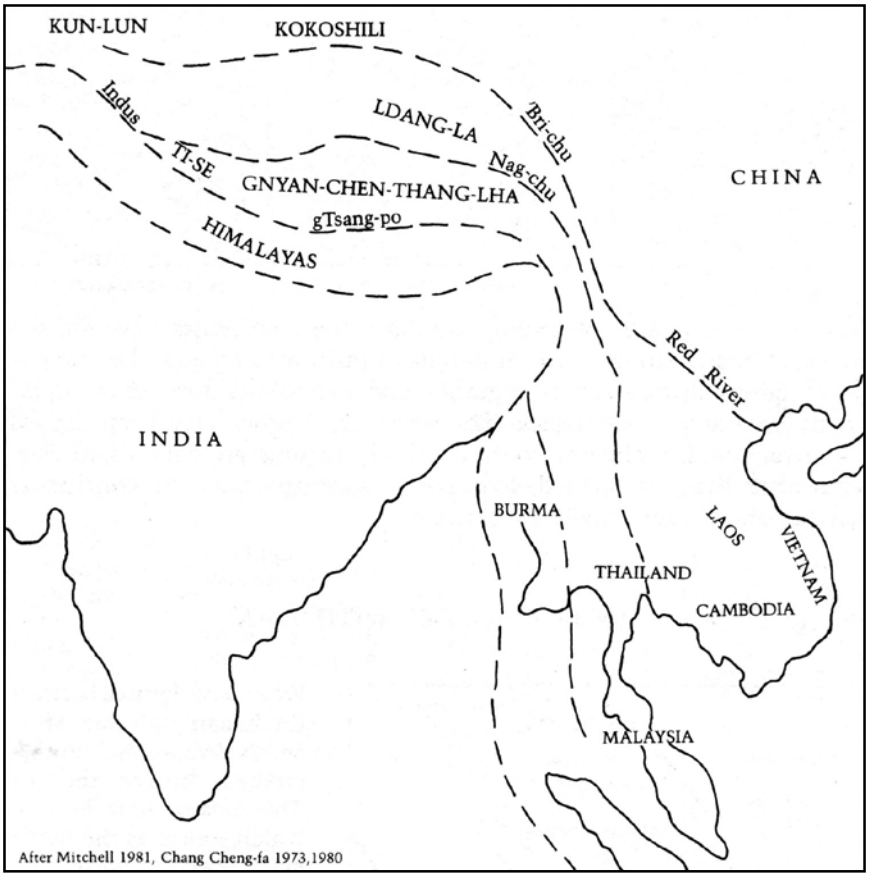
Plate Collisions



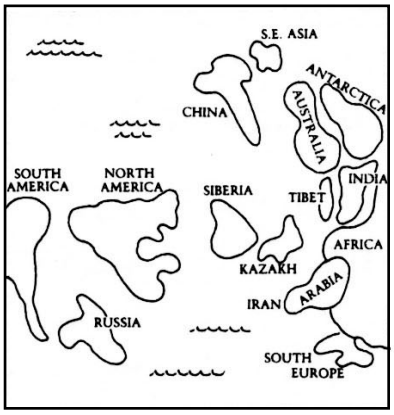
When a plate carrying oceanic crust collides with a plate carrying continental crust, the ocean floor bends beneath the continental plate, and is remelted in the deeper, hotter layers of the earth. This molten rock then rises, forming volcanoes along the edge of the continental plate. As the oceanic crust on a plate is consumed in this way, ocean between continents shrinks. This brings land masses into collision and builds mountain ranges as continental plates meet.

Formation of The Plateau

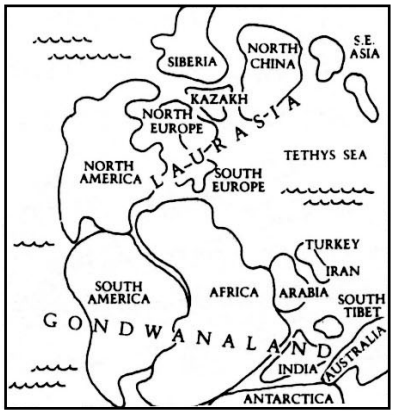
According to one current theory, the Tibetan plateau was assembled from several pieces of land that were added to Asia at different times. This theory is supported by the decreasing age of mountain ranges from north to south, and by the presence of what appear to be suture zones running across the plateau. About 200 million years ago, two distinct land masses joined Asia, one after the other. Both moved together with regions of southeast Asia. A third and final piece arrived 45 million years ago with the Indian plate.



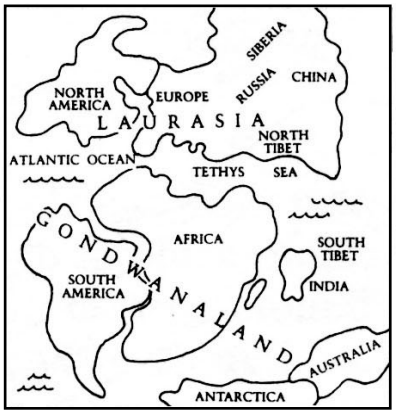
Shifting Continents



550 MILLION YEARS AGO



250 MILLION YEARS AGO

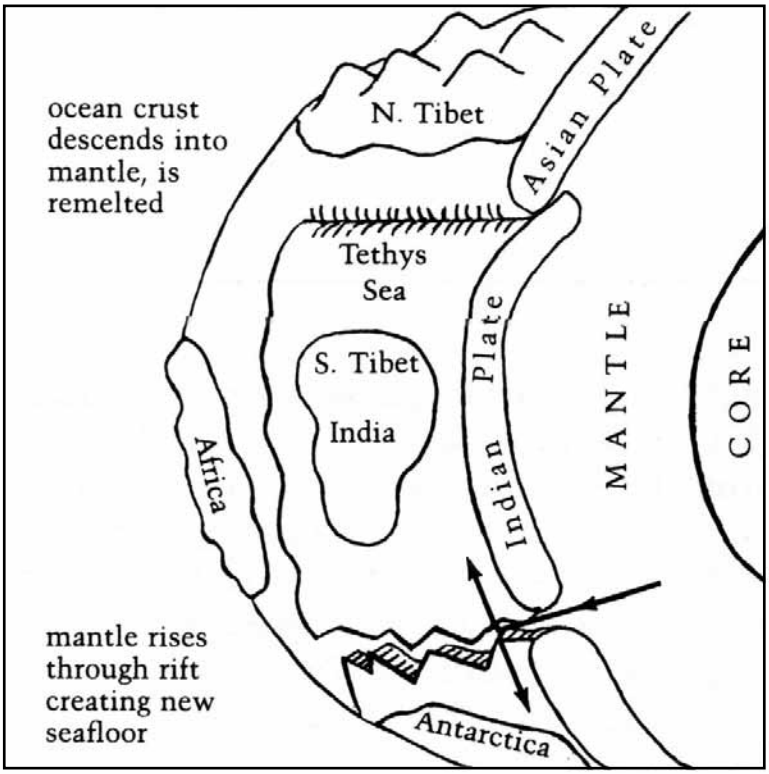


135 MILLION YEARS AGO

During the long ages of geologic history, the continents have shifted positions many times. Over hundreds of millions of years, the ancient land masses drifted closer together and eventually formed a super-continent known as Pangaea. The southern regions have been named Gondwanaland, while the more northerly regions are called Laurasia. Soon after Pangaea formed, it began to split apart, as the continents drifted toward their modern locations.

India Collides with Asia

When a rift formed between the Indian plate and Africa and Australia, molten rock erupted through the rift. This created new seafloor, which spread as the Indian plate moved north; the old seafloor descended into deeper layers of the earth along a trench at the northern edge of the Indian plate, closing the Tethys sea between Asia and India. As the plate progressed north, ocean floor was completely remelted, bringing the land masses on the Indian and Asian plates into collision.



The Himalayas: Abode of Snow

This great range circles the southern edge of the Tibetan plateau and turns north, running along the Tibet-India border up to Kashmir where the Indus river separates it from the Kara-korum range. The highest mountain range in the world, the Himalayas, meaning Abode of Snow in Sanskrit, have more than thirty peaks over 25,000 feet (8000 meters). These ranges contain valuable minerals such as antimony, arsenic, molybdenum, copper, zinc, and lead. The south side of the Himalayas is very rugged while the north side that meets the high plateau is more gentle. On the south side, the snowline lies at 15,500 feet (4600 meters), but rises higher and higher progressing towards the northern slopes. The north side is drained by tributaries of the gTsang-po river, which begin in Himalayan glaciers.

Three longitudinal zones can be distinguished in the Himalayas: the Great Himalayas, snow-covered peaks above 20,000 feet; the Lesser Himalayas, which include the mountains of Kashmir and Nepal; and the Outer Himalayas, made up of the Siwalik range in India.

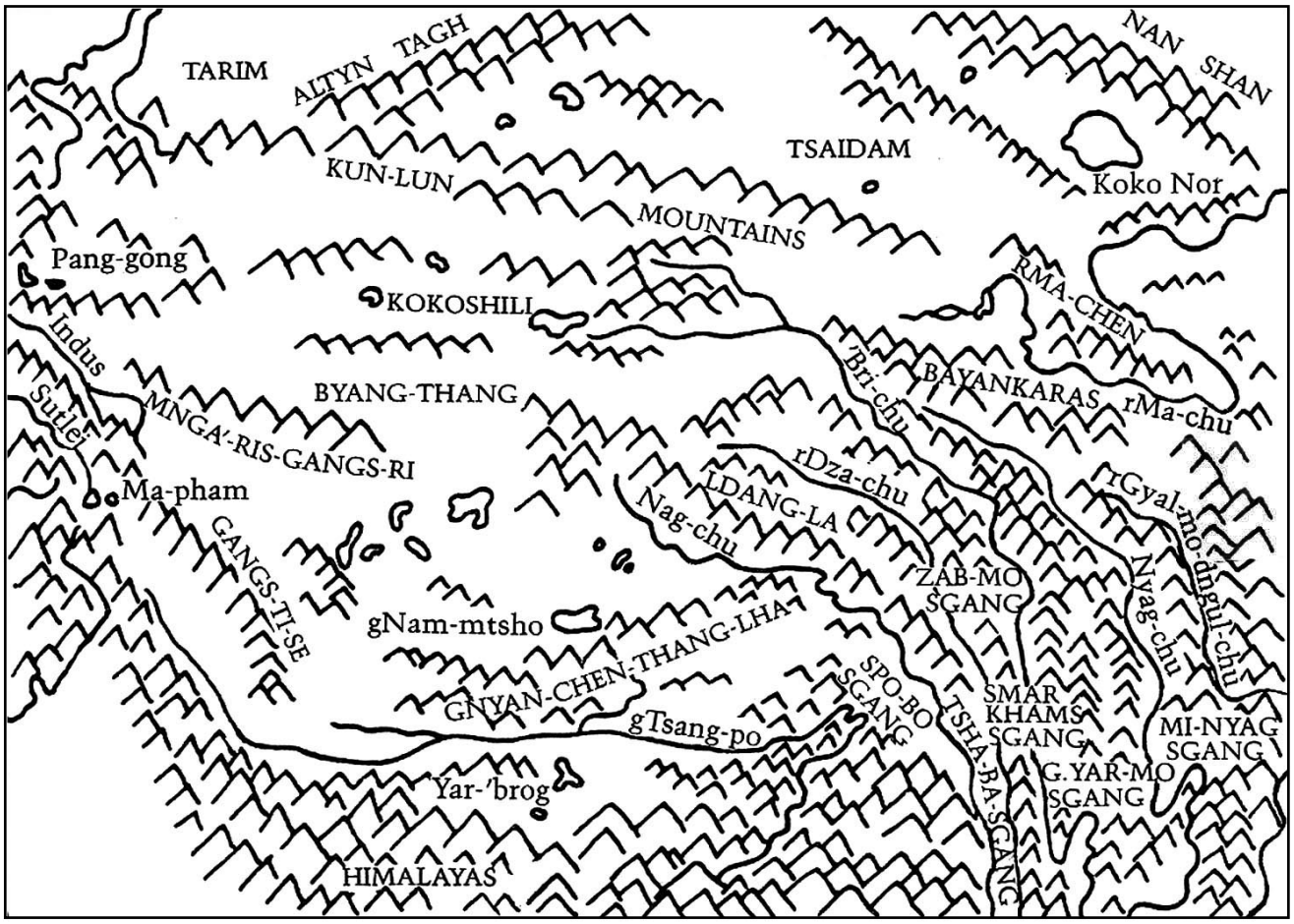
Lakes and Rivers

The Tibetan plateau is dotted with many spectacular lakes, some saline and some fresh. Byang-thang has numerous saline lakes of all sizes and shapes. Among the largest lakes in Tibet is Koko Nor in A-mdo, over 60 miles across and larger than Lake Michigan in North America. The lakes Oring and Tsaring are each about 25 miles wide. In central Tibet gNam-tsho measures about 50 miles across as does Zilling lake, while Dang-ra is about the same distance long, though not so wide. Yar-'brog's several petal-shaped extensions are 40 miles across. In the far west Lake Ma-pham is about 15 miles across and over 240 feet deep, while its companion

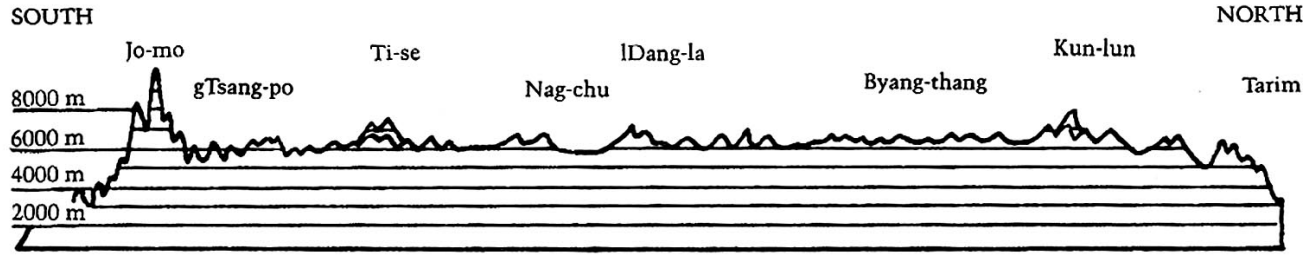
Lag-ngar is about 15 miles long. Lake Pang-gong in the northwest, a long L-shaped lake, has one arm running about 30 miles from north to south, and the other extending about 70 miles east to west.

The lakes on the plateau are an important source of minerals such as rock salt, mirabilite, gypsum, borax, magnesium, potassium, lithium, rubidium, cesium, strontium, uranium, and thorium. Though rich in minerals, the lakes are filled with extremely clear water, for very little soil muddies them. The thin air at such high elevations allows strong sunlight to penetrate deeply into the clear water, creating the bluest lakes in the world.

Mountains and Rivers in Tibet



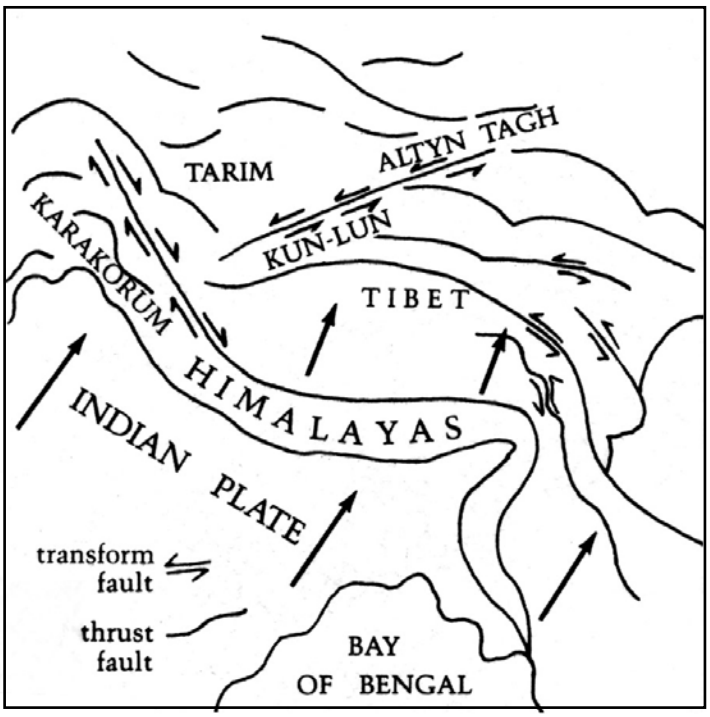
CROSS-SECTION OF THE PLATEAU



Higher than all of its neighbors, the land of Tibet is truly the Roof of the World. The plateau rises over 15,000 feet above sea level, and the surrounding mountain peaks often climb above 22,000 feet, soaring many thousands of feet above the lowlands of China, Central Asia, and India. Many of the world's highest mountains are found in the ranges around Tibet, especially within the spectacular Himalayas. Some of Asia's longest rivers originate on the Tibetan plateau, which is an important reservoir of water for all of Asia.

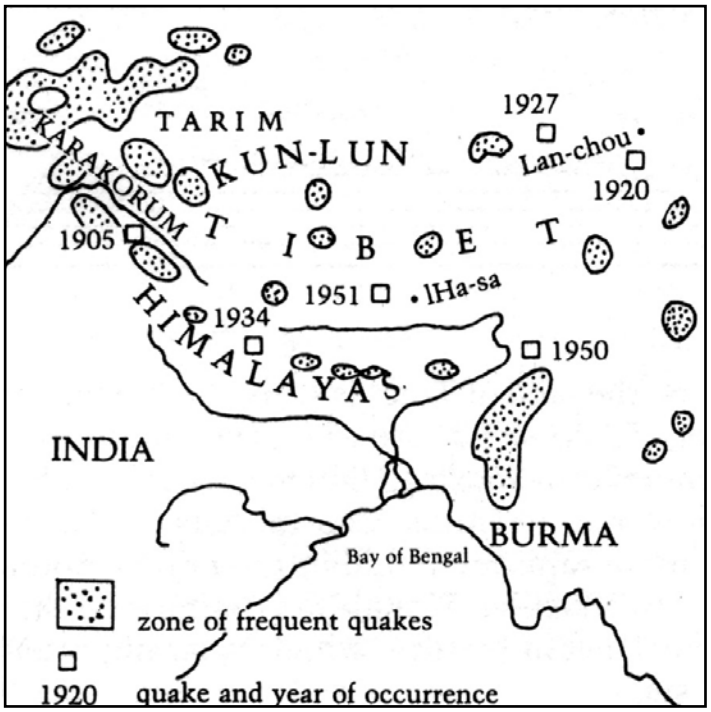
Faults across the Plateau

Deep faults across the plateau are thought to coincide with old plate boundaries. Transform faults (strike-slip faults) exist where plates slide past each other, and are found in the Kun-lun mountains along the northern border of the plateau, in the Himalayas and Karakorum ranges, as well as along the 'Bri-chu and the Nyag-chu rivers. Thrust faults occur where plates press against each other, and these exist in many regions of Tibet and in the Himalayas.



Earthquake Zones

Continuing activity of the crust beneath Tibet is indicated by the frequency of earthquakes of large magnitude. Deeper quakes take place in the mountains around the plateau, while the quakes on the plateau are shallow. In the past century, six large quakes have occurred, rated at least eight on the Mercali Scale, a condition where ground cracks on steep slopes, and towers and chimneys fall. The continuing pressure from the Indian plate is related to quakes across Asia.



A Century of Earthquakes in Tibet

1870
'Ba'-thang area

1893
Northwest of
Dar-rtse-mdo

1904
Southeast of
Brag-mgo

1911
Khyung-lung area

1913
Dro-shod area

1914
Nub-ru area

1915
Western Bayankaras

1915
Southeast of lHa-sa

1918
North of gTsang
gNam-ring

1919
Hor-khog area

1919
Southwest of
gSer-thal

1920
Southwest of
Kokoshili

1921
gNyan-chen-thang-
lha area

1923
Brag-mgo area

1923
'Ba'-thang area

1924
Kun-lun range

1924
gNyan-chen-thang-
lhat area

1926
Western
Kun-lun range

1926
Southwest of
Kokoshili

1927
East of A-mdo
mTsho-nag

1927
Nan Shan range

1930
East of A-mdo
mTsho-nag

1932
Northwest of
Dar-rste-mdo

1934
IDang-la range

1934
South of
Zilling lake

1935
Nag-tshang area

1935
South of
rGyal-rtse

1936
Southwest of Lan-
chou

1937
Oring-Tsaring lake
region

1937
Nub-ru region

1938
Northwest of
Koko Nor

1938
sPo-bo area

1938
West of
IDang-la range

1940
East of gNam-mtsho

1940
East of gNam-mtsho

1941
East of Dar-rtse-mdo

1944
Ngang-la-ring
3 large quakes

1947
Southwestern
Byang-thang

1948
Western Kun-lun
range

1948
Li-thang area

1949
Southern 'Gu-log

1950
South of gNas-chen-
gangs -ri: 11 quakes

1951
South of Chab-mdo

1951
gNyan-chen-
thang-lha area:
4 quakes

1952
East of gNam-mtsho

1952
South Tsaidam

1952
Southern 'Gu-log

1953
Western Byang-thang

1953
North of Dang-ra
lake

1955
Western I Byang-
thang

1955
Dar-rtse-mdo area

1957
West Nag-tshang

1958
West Nag-tshang

1959
IDang-la range

1959
Central Kun-luns

1962
Tsaidam

1966
Southeast Gu-ge

1966
North Byang-thang

1967
Hor-khog area

1971
Oring-Tsaring

1971
South of dGe-rtse:
2 quakes

Quakes greater than Mercali 6

The Ice Age

A distinct cooling all across the earth began about 3 million years ago. Though there have been many ice ages in the distant past of our planet, this most recent event is what is usually meant by the "Ice Age." It was during this era that humans arose, and culture had its beginnings (see chapter 5).

The Ice Age lasted until 14,000 years ago, but was punctuated by many warmer periods called interglacials that might last 10,000 years or more. As the climate shifted between glacial and interglacial, the vegetation on the Tibetan plateau shifted back and forth between forest and steppeland.

In glacial times, the forests receded from mountain slopes sometimes sparse spruce and fir forests would survive in sheltered valleys, but much of the landscape was treeless, shrubby grassland and steppe. During warmer periods, the temperature increased rapidly even in the northern areas. As glaciers melted new lakes formed across the plateau, and older lakes were replenished, while marshland increased. Trees returned to the valleys and lower mountain slopes, and alpine forests of pine, oak, birch, elm, and cedar flourished again.

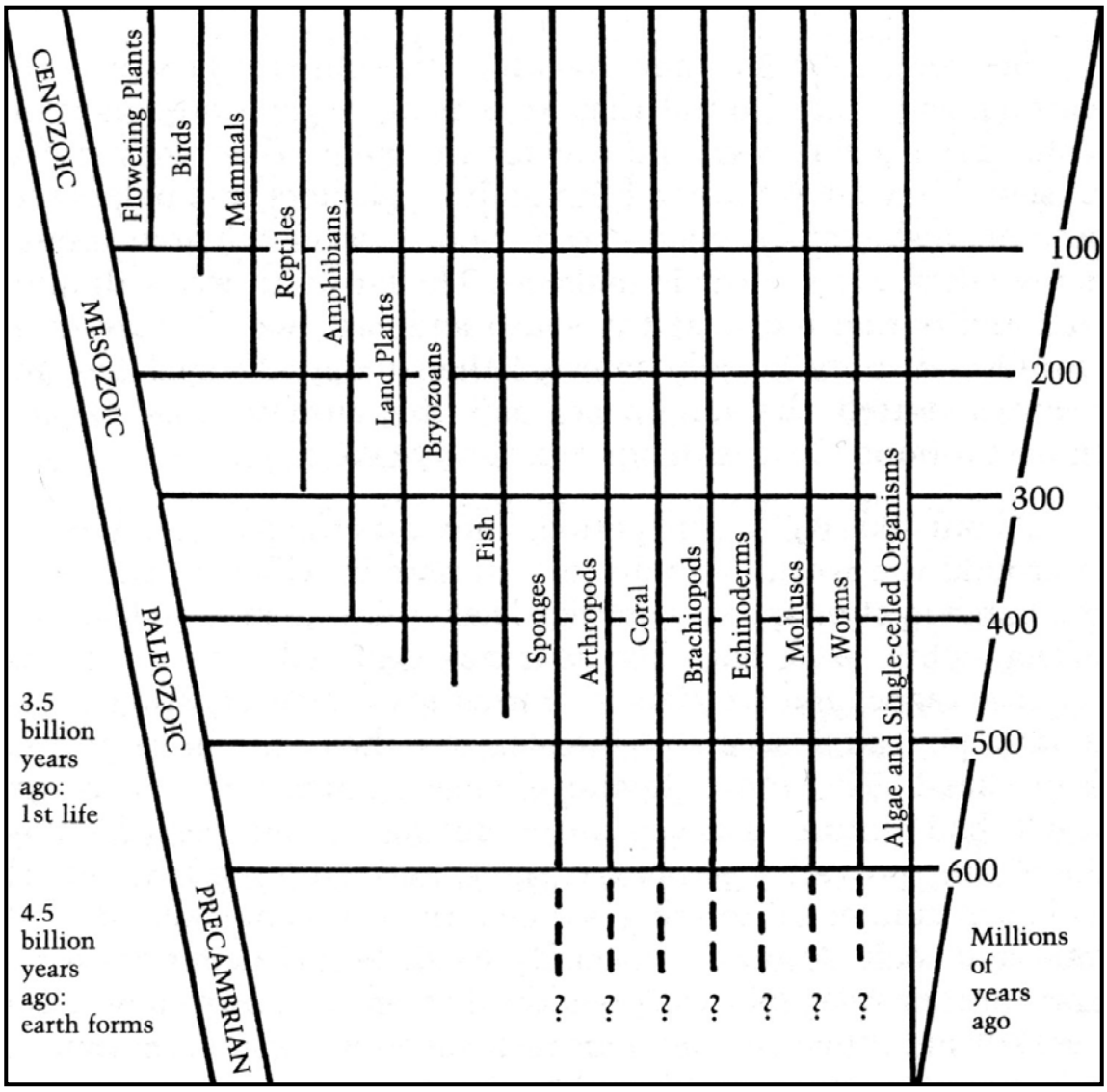
Since 1960 scientific expeditions have gathered information on glaciers at over twenty locations including Mount Everest. This data can be connected to well-known worldwide climatic changes. About thirty-four cold periods occurred between 3.25 million years ago and 128,000 years ago; the ice grew deeper about 2.4 million years ago. In this early part of the Ice Age, about 1.8 million years ago, glaciers formed on the highest peaks of the Himalayas, but not on the other Tibetan mountain ranges. About 700,000 years ago, the ice pack on the Arctic began to last through the summer months. In this middle period of the Ice Age, the climate in Tibet during the glacial periods was extremely severe, resembling that in polar regions today.

The worldwide decrease in temperature was intensified in Tibet because of the continued rising of the plateau, which was now happening at an accelerated pace. Some investigators believe the plateau had now reached 10,000 feet (3000 meters), and the Himalayas were 15,000 feet (4500 meters). Many mountains in Tibet were covered with glaciers by this time. On the Himalayas, huge glaciers, some of them 24 miles (40 kilometers) across, grew down into the foothills. Most of the slopes of Gangs-ti-se were glaciated as fingers of ice 12-15 miles (20-30 kilometers) long reached down the mountains. Valleys in Khams were filled with extensive glaciers nearly 80 miles (130 kilometers) long, and IDang-la glaciers also increased as ice came down the mountainsides, it pushed huge amounts of rock and gravel in front of it. When the climate warmed and the glaciers retreated, they left behind these new hills, called moraines.

As the plateau rose higher and higher, the Himalayas became so high they began to block moisture coming from the Indian Ocean. At higher elevations, the air above the plateau was thinner and less able to hold moisture, and solar radiation became more intense. Thus, the climate became less favorable to glaciers, which need moisture to form ice; now snowlines retreated, moving higher up on the mountainsides. From the middle of the last Ice Age, the glaciers on the interior of the plateau were diminished even in glacial periods. Those in the Himalayas and in the southeast, however, still received moisture from monsoons and remained extensive.

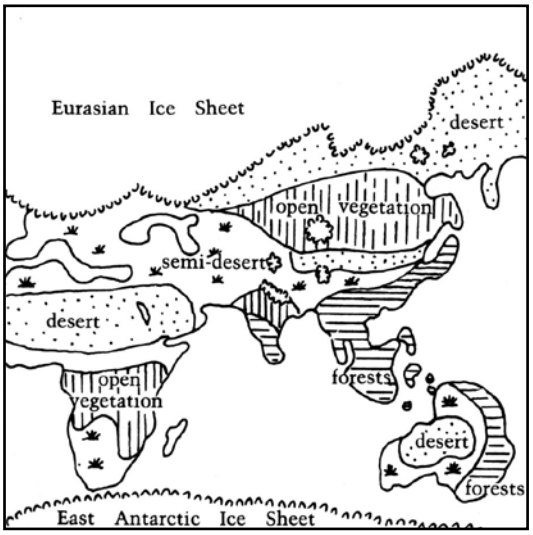
Though glaciers across the plateau were decreasing, permafrost became widespread. In this condition, the soil itself freezes and remains frozen for at least a year at a time, except for a thin layer on the surface that may melt during the summer months. The last major advance of the ice began 72,000 years ago. In the Far East, the onset of this cold period commenced about 70,000 years ago. About 58,000 years ago, a mild interlude took place, although this is not yet well documented for Tibet. The climate turned severely cold 28,000 years ago, becoming even harsher than the previous cold period. By 18,000 years ago, the ice reached its maximum.

The Theory of Evolution



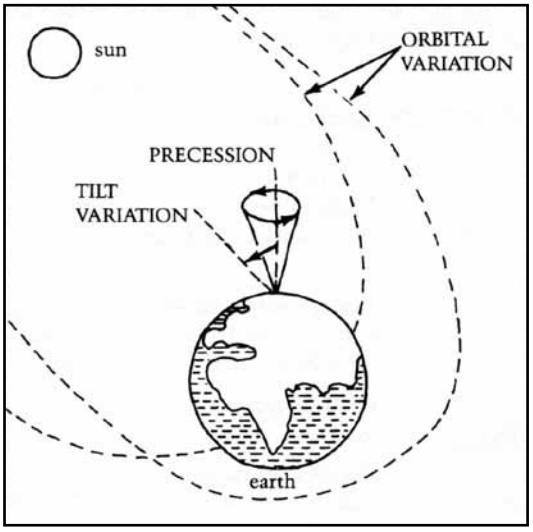
According to the theory of evolution, different life forms arose at different times. Single-celled plants and animals arose first; they gave rise to more complex forms, such as corals, worms, sponges, and seaweed. More advanced animals began to emerge by 450 million years ago. The earliest fish - first animals with a backbone - were followed by amphibians and reptiles. From a branch of the reptile line, mammals arose 200 million years ago. Among the mammals were the primates, which eventually gave rise to humans.

The Recent Ice Age in Asia



The most recent Ice Age began 3.25 million years ago, in a period when the plateau also began rising rapidly. This combination of events increased the severity of the Ice Age climate in Tibet. Across the world, steppe and desert replaced forests during the glacial periods, but trees and vegetation returned during the warmer inter-glacials. In Tibet, once the plateau had risen, the cool, dry climate could not support widespread forestland, and steppeland increased.

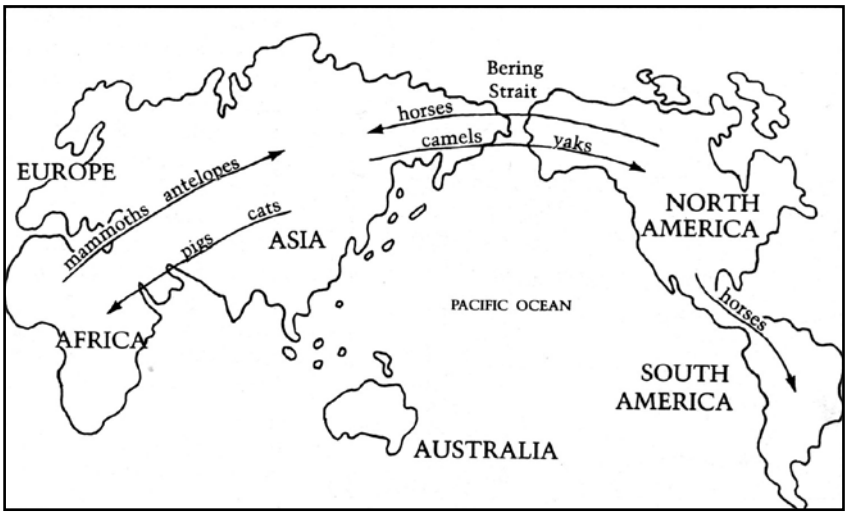
Causes of The Ice Age



The most recent Ice Age seems to be related to cyclical variations in the orbit of the earth around the sun, to changes in the degree of tilting of the earth's axis, and to changes in gyration of the axis known as precession. Glaciation is favored by cool summers and mild winters, which occur when the orbital is more oval than round, when the axis is less tilted, and when the closest approach to the sun falls in the winter. It is not yet clear whether earlier ice ages fit these cycles.

Animal Migrations

After Africa joined Asia 20 million years ago, animals began traveling between the two continents. Later migrations between Asia and the Americas also took place during the Ice Age when sea level dropped, and a land bridge appeared across the Bering Strait.



Southern Tibet

This environment is bounded by the ranges of Gangs-ti-se and gNyan-chen-thang-lha in the north and the Himalayas in the south. The climate is warmer and moister than in Byang-thang, but temperatures fluctuate greatly. Long, dry winters can be very cold, down to 7°F. (-14°C.), while summer temperatures reach 60 - 85°F. (16 -30°C.). In some places annual rainfall is 20 - 40 inches (500-1000 millimeters), most of it falling in summer and early fall. Monsoons reach the south sides of mountains, but the north sides of Gangs-ti-se and of gNyan-chen-thang-lha, as well as small enclosed valleys, are left quite dry.

To the west, the climate is drier and colder. Gar-thog has rainfall as low as that in Byang-thang. Winter temperatures reach 11°F. (-12°C.), and alpine steppes predominate.

The south sides of Gangs-ti-se and gNyan-chen-thang-lha have fairly regular vegetation zones. The regions of alpine steppe are very well developed with many kinds of plants such as juniper, barberry, honeysuckle, and cotoneaster. Wildflowers, clover, sedge, dandelion, and foxtail grow in the meadows. The valleys of the gTsang-po river in its upper and middle course are shrubby steppeland. Shrubs and dwarf willows and poplar can be found across the valleys in gTsang, but true forests begin only in the river valleys east of lHa-sa. To the east, in Kong-po and Dags-po, mountain slopes have abundant coniferous forests, with fir and rhododendron growing at 13,000 feet (4000 meters), hemlock and spruce or larch growing at 10,000 feet (3000 meters), and pine or laurel at 5000 feet (1500 meters).

At the bend of the gTsang-po around the gNam-lcags-bar-ba region, the climate grows even more moist and warm, and forests are complex and extensive, similar to those in the southeast of Khams. Fir, maple, cherry, and hemlock grow on the upper slopes to 13,000 feet (4000 meters); bamboo, evergreen oak, camphor, and magnolia woods grow lower down. At even lower elevations are found tree ferns, banana trees, wild orange, and palm. Tropical forest covers the land below 3000 feet (1000 meters) with myrtle, banyans, orchids, fig trees, and tropical almond trees.

The southern valleys are a source of gold and iron, as well as coal, talc, granite, and magnetite. Animals in the south include foxes, leopards, many rodents, and musk deer. Compared to Byang-thang, the southern valleys are inhabited by a much larger variety of birds, including green snowcocks, bar-headed geese, finches, mountain turtle doves, sun birds, magpies, tree creepers, and snow finches. The more tropical zones to the east merge with the southeastern forest land (see below) and are the home of species found in east and southeast Asia, such as leopards, wild cats, monkeys, bats, and many colorful birds.

Glaciers on The Tibetan Plateau

The Tibetan plateau and the surrounding mountains are the most extensive area of mountain glaciation in the world today, encompassing 18,190 square miles (46,640 square kilometers) of glaciers. This is half of all the glaciated area of Asia. The presence of glaciers and the level of the snowline in Tibet depend on the amount of precipitation,

the atmospheric circulation, and the amount of solar radiation, all of which are interrelated with temperature and elevation.

The high plateau receives large amounts of solar radiation and small amounts of precipitation. Thus, across Byang-thang glaciers are not so extensive as those in the surrounding mountains. Plateau-type glaciers are small ice caps or flat-top glaciers. The high reaches of the western Kun-luns receive large amounts of precipitation from winds blowing in from the west, so glaciers there are very large. The south slopes of the Himalayas, especially in the east, receive more rain from monsoons than the north slopes, and so have more glaciation.

Between 1950 and 1960 glaciers on the Tibetan plateau were reported to be shrinking, as were the glaciers in the European Alps. In the Kun-luns, the Pamirs, the Himalayas, and the Kara-korum mountains, glaciers increased in the 1970s, but those in the interior of the plateau did not increase. Of 116 glaciers studied by scientists over the past ten to thirty years, 62 are decreasing and 32 are increasing.

Agriculture on - The Roof of the World

Tibet has the highest upper limit of agriculture in the world. The climate is especially suited to wheat and barley, and cold-resistant highland barley can be cultivated even at 15,500 feet (4750 meters). The most important agricultural regions are along the Yar-lung and gTsang-po rivers, the Nyag-chu (Nu Jiang), the rDza-chu (Lancang Jiang), and the 'Bri-chu (Jinsha Jiang). The elevation varies in these regions between 9000 and 13,500 feet (2700-4100 meters). Weather is mild and cool in the growing season, and the temperature rises slowly in spring. Rainfall is not extreme and usually is limited to night hours so that there are numerous sunny days. Second harvests are possible in some areas: barley followed by wheat, barley followed by millet, or rice followed by barley.

The high-altitude agriculture is possible because the plateau, at its great height, absorbs large amounts of solar radiation, and the air close to the ground is heated by radiation from the land. The temperature on the plateau is higher, especially during the growing season, than on steep mountains in other parts of the world at the same elevation and latitude.

Rice and maize can be grown only at lower elevations; thus rice cultivation in Tibet is possible in the deep valleys in the southeast and around the huge bend in the gTsang-po where it turns south toward India. Rice crops are much more common in neighboring regions such as the south slopes of the Himalayas and in Yunnan and southeast Asia.

In addition to cereals, peas, and potatoes, which grow in many areas, certain regions are especially suited to crops that are not widespread. Apples, walnuts, and pears grow in the central gTsang-po valleys, while tea, grapes, tangerines, bananas, and oranges grow in the southeast. Jujube and apricots are plentiful in mNga'-ris in the west. At lower elevations in many regions, cabbage, tomatoes, cauliflower, onion, garlic, celery, radishes, turnips, and strawberries can be grown. Recently, additional kinds of crops have been cultivated experimentally.

Part Two : The People

The Earliest Humans

Most researchers agree that the oldest primitive but true human discovered as yet anywhere in the world is *Homo habilis*, a fossil human from Africa about 2 million years old. The oldest fossils of the more advanced and clearly human *Homo eiectus*, who lived between 1.5 million and 300,000 years ago, have been found in Java and Indonesia as well as Africa. In Africa *Homo erectus* coexisted briefly with *Homo habilis* and with the last of the Australopithecine ape-men.

Later fossils of *Homo erectus* have been discovered at several sites in Africa, China, India, southeast Asia, and in Europe. By 500,000 years ago, this primitive man was capable of planning and cooperating in big game hunts and was adaptable enough to live in a variety of climates. He had learned how to use fire and could construct dwellings and make simple clothes from animal furs. To make the tools he needed, he chipped stone into axes and knives.

Between 300,000 and 30,000 years ago, more modern humans with larger brains - sometimes called archaic *Homo sapiens* - were living in Europe, Asia, and Africa. Another group usually classified as early *Homo sapiens* is the Neanderthal peoples. Though physically stockier and more powerfully built than modern humans, the Neanderthals actually had larger brains than we do. They lived in Europe and Asia between 120,000 and 40,000 years ago, and for 80,000 years Neanderthal culture was predominant across Eurasia. They are thought to have communicated well with each other, though anthropologists speculate that their speech may not have been so rapid as modern man's. They shared religious beliefs and rituals, evidenced by elaborate graves. How the Neanderthal populations and other archaic human beings were related and whether they interbred are unresolved issues in anthropology today.

Modern Humans

Where and how modern men first arose is still uncertain. Evidence from genetic mapping, which compares the traits of aboriginal peoples, suggests an original homeland in western Asia, somewhere between the Caspian Sea and the Indian Ocean. Such genetic analysis seems to indicate that all the various groups of modern human beings did not evolve independently over hundreds of thousands of years from different ancient lineages. According to this view, all people today have descended from common ancestors who lived no more than about 50,000 years ago. Where this line of modern man began is debated - perhaps from a branch of Neanderthals, from some population of archaic *Homo sapiens*, or from some other as yet unknown ancient lineage tracing back to *Homo erectus*. As more fossils are discovered, a clearer picture may emerge.

Research in Europe indicates that by 35,000 years ago, the Neanderthals had disappeared, while fossil evidence from around the world shows that modern humans were soon widespread. They lived in Europe by 35,000 years ago, Africa and Siberia by 32,000 years ago. By 19,000 years ago, they had reached North America, having apparently crossed the Bering Strait.

Anthropologists describe how human culture took great steps forward in the hands of more advanced humans, who were physically indistinguishable from modern people. Finer stone tools were developed, and the bow and arrow were invented. Skins and furs were sewn together to

make tents and clothing and even boats. The world's first known artistic tradition began at this time. In Europe walls of caves, as well as small artifacts, were painted and engraved, and small figurines were carved.

Evidence from The Tibetan Plateau

Stone tools found at Kokoshili in the north and Ding-ri in the south provide the earliest evidence of human habitation in Tibet. Those from Ding-ri are flake tools made with a stone hammer, while those from Kokoshili are more ancient crude pebble choppers. The tools are clearly from the Old Stone Age, the most ancient phase of human culture. This era extends from almost 2 million years ago until the end of the last Ice Age 10,000 years ago, and includes the tools made by all primitive humans as well as early modern man.

Publications on archaeology from the Academia Sinica in 1980 have placed the Tibetan tools from Kokoshili in the Old Stone Age, without any specific estimate of date. Those from Ding-ri are put either in the middle part of the Old Stone Age, contemporary with the Neanderthals in Europe, or in the late Old Stone Age when modern man emerged 40,000 years ago.

Where did the Stone Age inhabitants of Tibet come from? Did they develop from earlier, as yet undiscovered, primitive humans on the plateau? Did they migrate from some other homeland? Until additional research is done throughout Tibet, the age and origins of the people who made these tools thousands of years ago will remain uncertain.

Evidence of early modern man has just recently been discovered on the Tibetan plateau in the Tsaidam basin west of Koko Nor lake. Archeological investigations reported in 1985 mention stone scrapers, knives, drills, and axes, together with tools made of bone and horn dated to 33,000 B.C. These artifacts were found at Xiaochaili lake in the center of Tsaidam where freshwater shells more than 38,000 years old were also discovered. Though Tsaidam is a dry, salty desert today, in ancient times it had abundant vegetation and animals, numerous freshwater lakes, and heavy rainfall - a suitable environment for human beings.

Traces of Ancient Communities

Knowing the Tibetan plateau was inhabited during the Old Stone Age, we might expect the descendants of these early peoples to be living in Tibet in later times. Along the eastern end of the gTsang-po river and in the regions of Kong-po and sPo-bo, traces of primitive communities have been found, including both cave dwellings and "nest" dwellings. Archaeologists at work in Tibet have reported how these "nests" were built around a central wooden pole that supported a roof of bamboo and wood, while mats of straw plastered with mud formed the walls. Caves that appear to have been inhabited in ancient times have also been noted by Western explorers at Luk, IHa-rtse, Yar-'brog, Yar-lung, and in Byang-thang.

The era when the "nests" and caves were inhabited has not yet been determined. In the future, intensive field work, especially along the gTsang-po and its tributaries in central Tibet, may allow a more detailed description of these early settlements.

These regions in central Tibet are traditionally associated with the rise of Tibetan civilization. The first kings made their court in Yar-lung near the gTsang-po river, and the very first Tibetan tribes

are said to have lived in the same region. In the eighth century, King Khri-srong-lde-btsan came upon unusually colored clays and measures of green rice as he made the foundation for bSam-yas monastery not far north of Yar-lung. Ancient-looking objects in bizarre and interesting shapes often were uncovered when foundations were laid for monasteries, but many of these finds have long since been lost. If historians and archaeologists could assemble any of these ancient artifacts that remain, their study might offer helpful clues to the past.

Other regions of Tibet have yielded evidence of prehistoric peoples who were clearly early modern humans. Small, specially shaped stones have been discovered recently near Zilling lake in Byang-thang, at Nya-lam, Chab-mdo, and Nag-chu. Finely chopped pieces of stone such as these have been reported by archeologists in many parts of the world. The small stone blades were affixed to shafts to make tools such as harpoons or spears, suggesting that these sites may have been hunters' camps. The exact age of this Tibetan material is uncertain. Archaeologists associate this style of tool, known as microlithic, with Middle Stone Age hunting and gathering cultures, which generally arose as the Ice Age ended shortly before 10,000 B.C.

Farming Cultures

As the Ice Age drew to a close, a great advance in human civilization occurred in several parts of the world - the development of farming. Recently published studies now place the planting of carefully selected crops as early as 8000-9000 B.C. at Jericho in Palestine, spreading from the Near East into Europe by 6500 B.C. Another center of early farming developed in the lower Indus valley in modern Pakistan, and another in China by 5500 B.C., perhaps spreading from the farming culture that had begun in Thailand as early as 8000 B.C.

Farming practices began to change the very structure of societies. Anthropological research around the world has shown that together with the permanent settlements of farmers came the rise of specialized social classes, more varied styles of life, and more refined technologies than roving bands of hunters possessed. In addition to planting and harvesting grain and vegetables, the farmers tamed and eventually domesticated animals.

Many decades of research on several continents show that in some parts of the world, the older hunting cultures were gradually replaced by the new farming cultures. As fields were depleted, the farmers opened up more and more forestland to make new fields. In Tibet, forests of game and fertile farmland would often have been located together in the river valleys, but the competition between hunters and farmers may not have been intense. Huge expanses of grassland, too dry for intensive agriculture, would have been available to hunters. Wildlife was plentiful in this natural pastureland, especially wild grazing animals such as kiang, yak, sheep, and antelope. According to Tibetan chronicles (see chapter 10), farming was not widely practiced until the time of the ninth Tibetan king about two thousand years ago when irrigation techniques were developed. So it seems likely that hunting societies endured for thousands of years.

Some early tribes on the plateau did settle down to become farmers, for evidence of farming villages has been discovered in several locations in and around Tibet. Near Chab-mdo three dwellings found in 1978 have been dated to 3500 B.C. The houses were built with animal shelter on the ground floor and living space on the second floor, a design still in use in Tibet today. At

this same Site, stone artifacts, pottery, and bone needles were found. Archaeologists believe these inhabitants lived mainly by hunting, but also practiced farming.

A site discovered in 1958 at Nying-khri, north of the gTsang-po river in the Kong-po and Nyang river region, yielded human bones that also belong to this early farming era. Later investigations in 1975 uncovered fifteen stone artifacts and over one hundred pottery shards.

Nomadic way of life

The pastoral, nomadic way of life in Asia seems to have developed only after farming arose in the Near East. Anthropologists have determined that sheep and cattle were first domesticated by settled farmers in the Near East, perhaps as early as 7000-8000 B.C. Bands of hunters in steppe regions unsuited to agriculture began to develop a mobile, pastoral culture that was flourishing by 3000 B.C. This way of life centered around the seasonal migration patterns of animal herds.

Just north of Tibet grassy steppeland stretches along the north side of the Tarim basin to Mongolia. To the west this natural pastureland extends along the north side of the Iranian plateau, past the Caspian and Black Seas across southern Russia, all the way to Hungary. Herds grazing on this steppe are sources not only of meat and dairy products, but also fiber for textiles, and hides, dung for fuel in treeless regions, transportation for people and goods, and power for hauling.

The nomadic lifestyle required more highly organized social structures than simple hunting bands. Herds had to be protected against wild animals and other nomadic tribes, and whole communities had to be moved at the proper times. Anthropologists usually describe early nomadic society as warlike, in contrast to the more peaceable, settled farmers. When men from the steppes learned to harness horses to chariots, about 1700 B.C., they overran Europe, western Asia, and India. Not until after 900 B.C. was the technique of riding horseback perfected, but this skill gave the warriors of the steppes a tremendous advantage over their settled neighbors. Indo-European tribes ruled the steppes until 100 A.D., followed by Turkish and Mongolian nomads.

Though the relationship between the farming, hunting, and nomadic ways of life in ancient Tibet is not yet clear, it seems quite possible that early Tibetan civilization was not unlike the steppe culture to the north. Large stretches of the Tibetan highlands are open grassland, and Tibet has historically had a large nomadic population. It has not been determined when domesticated horses were first used in Tibet. One recent research report indicates that the yak was domesticated in Tibet about 2500 B.C., while evidence of domesticated sheep and goats has been found in several farming sites on the plateau. Specialists in prehistoric Asian art note that the style of many ancient ornaments and rock carvings found in Tibet suggests close links to the early Central Asian steppe culture. Carvings of animals, men on horseback, and warriors, similar to Central Asian artifacts, have been found in Khams, in Ladakh, and in gTsang. Many ancient but undated objects in this style have been discovered - buttons, buckles, bells, pendants, and beads, as well as bronze figurines of animals such as lions, monkeys, and various birds. Future archeological investigations may be able to clarify the relationship between ancient Tibetan and Central Asian cultures.

Megalithic sites

Other prehistoric sites in Tibet include a number of locations where large stones, known as megaliths, have been set in the ground in circular or square arrangements. Megaliths have been

found near Rwa-sgrengs and Sa-skya in central Tibet, and in the far west at sPu, Shab-dge-sdings, gZhi-sde-mkhar, and Byi'u near Ma-pham lake. Close to Pang-gong lake in the northwest are eighteen parallel rows of standing stones aligned in an east-west fashion with circles of stones arranged at the end of each row. In western gTsang at Sa-dga' is a large gray stone slab surrounded by pillars of white quartz. Near Dang-ra lake are also large standing stones encircled by slabs, as well as sites that appear to be ancient square tombs. Western scholars have suggested these may be tombs or burial sites or possibly sacred arenas of some kind.

Unusual stones in striking shapes and colors are located in Kong-po, sPo-bo, and rTsa-ri, as well as caves and rock formations that have struck the inhabitants as having mysterious significance. The ancient kings of Tibet later erected stone pillars at their tombs and other locations in central Tibet. Whether these unusual stones and pillars are related in any way to the megaliths in other regions of Tibet is not clear.

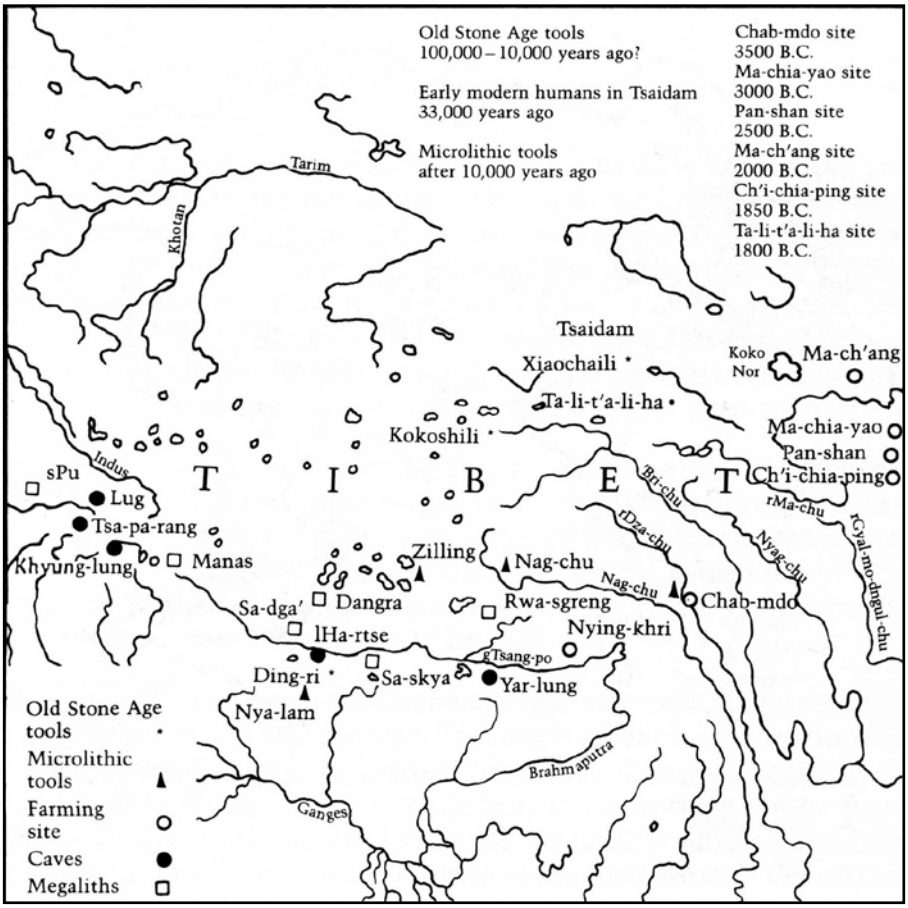
The Tibetan megalithic sites have not been dated, but similar huge, undressed slabs of rock have been discovered in Europe at sites dated to as early as 3500 B.C. Traces of this megalithic culture have been found throughout the Mediterranean and on the east African coast. Megaliths have also been discovered in India and southeast Asia, dated to about 1000 B.C.

Megaliths in Europe and south Asia are often found together with graves, and specialists propose that they are associated with specific religious ideas about an afterlife; other sites appear to be designed for the purposes of astronomy. The megalithic cultures in Europe are believed by some investigators to be connected to ancient Egyptian civilization, though some sites predate even Egypt. Someday persistent scholars may understand the significance of the Tibetan megaliths and know whether a relationship exists between the various kinds of Tibetan stones and the megaliths of other ancient civilizations.

Prehistoric Ancestors

Sometime between 15 and 5 million years ago, the human line developed from ancestors related to the apes. *Ramapithecus*, who lived 15 million years ago, is no longer believed to be in the human line, *Australopithecus* lived 3.75 million years ago and appears to be a forerunner of *Homo habilis* and *Homo erectus*, true but primitive humans. *Homo erectus* flourished 500,000 years ago and presumably gave rise to several different types of early *Homo sapiens*, from which fully modern humans emerged about 40,000 years ago.

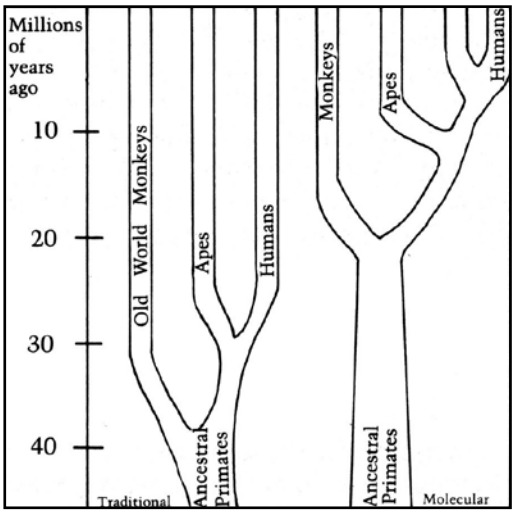
Prehistoric sites In Tibet



The most ancient prehistoric finds from Tibet are tools that are not yet precisely dated, but belong to the middle and late parts of the Old Stone Age. Tools from the middle of the Old Stone Age are generally associated with Neanderthal-type populations, while late Old Stone Age tools are related to early modern populations. Evidence of early modern man has been found in Tsaidam; hunting camps, evidenced by microlithic tools, and farming villages have also been discovered. Megalithic sites and caves are undated, but appear to belong to ancient times.

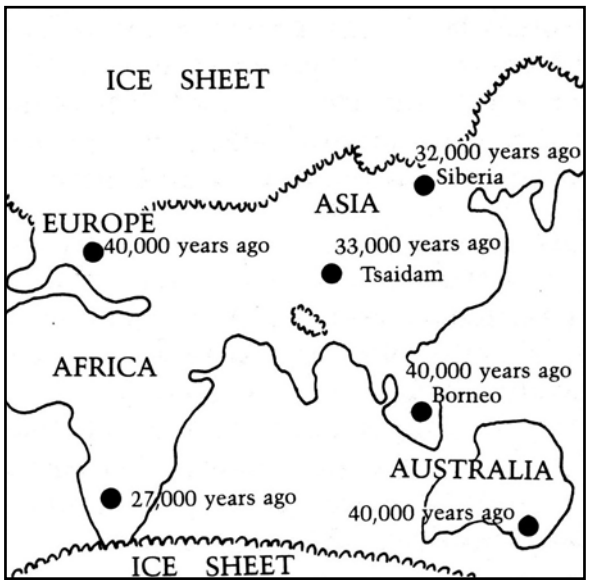
Evolutionary Timetable

Different timetables for the emergence of the human line from the ape and monkey family are suggested by traditional anthropological methods and by molecular dating. This modern technique offers a measure of the closeness of relationship between organisms by determining the degree of similarity in proteins or DNA. This measure suggests that human ancestors emerged more recently than had been believed, but still more than five million years ago.



The First Modern People

From ancestors that have been traced back 3.75 million years, modern humans first emerged 40,000 years ago, spreading rapidly and widely across Europe and Asia. Evidence based on genetic mapping suggests that modern humans might have first arisen west of Tibet and north of India, Early modern humans lived in the Tsaidam basin on the north edge of the plateau as early as 33,000 B.C. The connection between this population and later inhabitants is not yet clear.



Little kingdoms

As the power of the nonhumans declined, the original tribes took control of the land, though systematic histories never describe any specific events in this process. In various chronicles scattered remarks can be found about struggles among the Ma-sangs, nonhumans, and certain tribes in ancient times. It would be interesting to assemble and compare such references.

Eventually twelve, twenty-five, and then forty small kingdoms arose, about which we have very little information except for some of the names of rulers and regions. Lists from Tun-huang and other old records include such places as mChims-yul, Zhang-Zhung, Myang-ro, gNubs-yul, Myang-ro-sham-bong, sKyi-ro/Gyi-ri, Ngas-po/Ngam-shod, 'O-yul/'Ol-phu, Sribs-yul/Srin-yul, Kong-yul, Myang-yul/Nyang-yul, Dwags-yul, dBye-ro/gYe-na, Klum-ro, Sum-yul, 'Brog-mo, and rNgegs/rNgegs-yul Se-mo.

Tibetan histories describe how during the centuries before the first king, power was divided among these many factions. One group or another was dominant for a while, only to decline or be overthrown. In this era of fragmentation, according to the bKa'-thang-sde-lnga, time and again Tibet was threatened on all sides by powerful neighbors, while within its borders there was no regard for moral behavior. Though laws existed to punish wrongdoing, people lacked concern for society as a whole, and were driven by personal greed for territory and property. No ruler possessed enough strength or respect to unite the little kingdoms and protect the land. At the mercy of confusion and poverty, the population could not progress beyond the level of bare survival.

Four Great Cultures

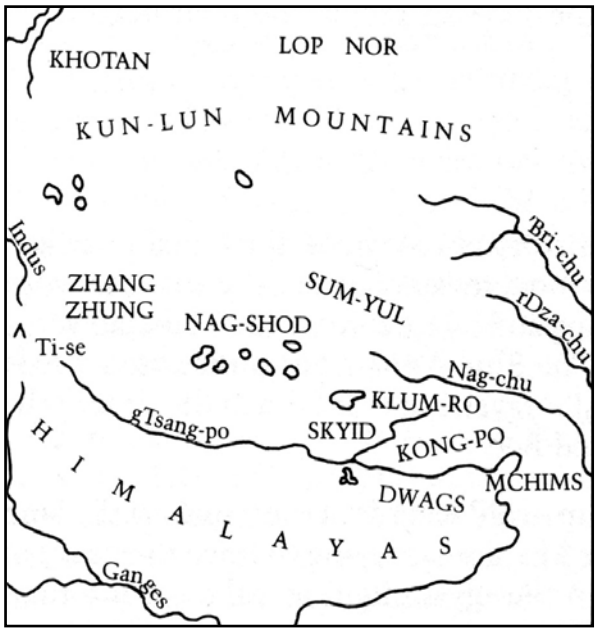
At some point in time, the tribes were connected with four great cultures: bSe with 'A-zha, dMu with Zhang-Zhung, sTong with Sum-pa, and iDong with Mi-nyag. These cultures may have been founded by people with ancestry different from the Tibetans, becoming associated with the tribes at a later date. Or they may have been established by the Tibetan tribes, who over time developed distinctive cultures in different regions.

According to some Bon texts, the four tribes, the twelve little kingdoms, and the four cultures were linked together even before the first king. According to these sources, the twelve kingdoms sent tribal representatives to the king: IDong from Mi-nyag, 'Bru from Sum-pa, sBra from Zhang-Zhung, and rKa from 'A-zha. But other records paint a different picture. For example, in some Tun-huang documents the bSe tribe is called one of the ancient vassals of the king in Srong-btsan-sgam-po's father's time, while other Tun-huang records clearly point out that 'A-zha was first conquered by Srong-btsan-sgam-po. The names of Zhang-Zhung and Sum-pa can be found in the lists of the twelve little kingdoms, but the names of 'A-zha and Mi-nyag are not found.

From the Tun-huang documents we know approximate loca-lons for some of these cultures in the time of the Dharma Kings, or these cultures were part of the Tibetan Empire at that time. A-zha was located in the northeast around Koko Nor, Zhang-Zhung was centered around Mansarovar in the far west, Sum-pa occupied parts of the east and the central plains of Byang-thang, md Mi-nyag was along the eastern borderlands. How extensive these cultures might have been in more ancient times is uncertain.

To clarify these issues, one would need to sift through many different kinds of material - genealogies, biographies, local records, Bon lore, and folk stories - each of which presents special difficulties. Origin stories exist about some famous clans, but often these are juxtaposed to seventh or eighth century events, leaving huge unexplained gaps in chronology. Lists of ancestors and descendants are hard to date without cross-referencing individuals, tracking them through a maze of aliases and nicknames. Folk stories sometimes mix together historical events with strange episodes that are more difficult to evaluate.

Nonetheless, a thorough study of the history of the tribes might help resolve some interesting questions. Did the tribes originally have specific territories? Did they speak different languages or dialects? The Zhang-Zhung culture is said to have had distinctive language in ancient times, and some regions of modern Tibet, such as Hor-khog, rGyal-mo-rong, and Mi-nyag, are known to have languages that differ from Tibetan. Did each tribe have its own distinctive sacred rituals and oral traditions (as certain rituals are said to be especially connected with the Sum-pa culture even today)? Could different oral traditions from the various tribes help explain the discrepancies sometimes found in comparing old records and genealogies?



Little Kingdoms of Ancient Tibet

Before the first king of Tibet, gNya'-khri-btsan-po, arrived in the 3rd century B.C., Tibetan tribes were not united. Constant struggles took place among the tribes, who were ruled by chiefs holding power only within their own regions. Traditional lists of these kingdoms include twelve or more place-names, not all of which can be located with certainty. A number of kingdoms seem to have been centered around the gTsang-po and the Nag-chu rivers in central Tibet.

Ch'iang Tribes on The Plateau

According to Han dynasty annals, tribes known as Ch'iang and Ti or Tik lived west of Ch'ang-an as early as 1500 B.C., and were reported all along the eastern borderlands of the Tibetan plateau by 500 B.C. They began spreading north and south as they divided into many tribes. Some T'ang records call trhe Ch'iang the ancestors of the Tibetans, but not until the seventh century did Chinese historians have any knowledge of central Tibet where the ancient kings resided.

Regional Names in later Times

Over many centuries, the Tibetan tribes spread across the plateau, inhabiting the valleys and mountainsides everywhere but in the driest reaches of Byang-thang. The map above shows approximate locations for some of the different districts that developed over time. Lack of

space makes it difficult to represent accurately the extent of various regions, and also makes it necessary to leave out many important place-names. Tracing the founders and development of these and other districts would be one way to help fill in some of the gaps in the history of the Tibetan tribes. Local chronicles and genealogies might prove useful sources for such a study.

Records of Ancient Tribes

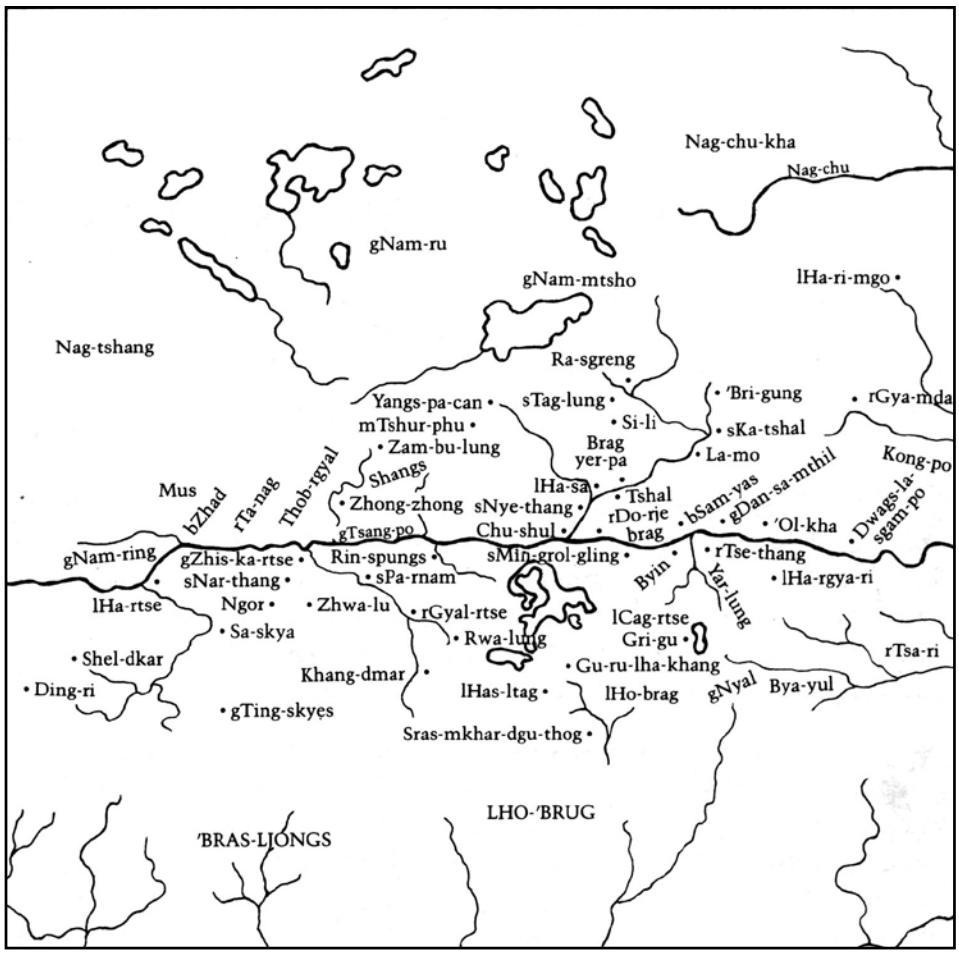
Records from the Han, Sui, and T'ang dynasties mention numerous tribes living on the Tibetan plateau in the period before the 7th century when the kings in sPu-de's lineage from the Yar-lung valley conquered all of the peoples on the plateau. The relationships among tribes named in the Man, Sui, and T'ang annals and IDong Mi-nyag, dMu Zhang-Zhung, sTong Sum-pa and bSe 'A-zha, are not yet clear. These four tribes are said to be the ancestors of the Tibetan people.

The 'A-Zha Kingdom

In the northeast corner of the plateau, the T'u-yü-hun, Turko-Mongol peoples from northeast Asia, established a kingdom in the 4th century, a time when northern China was also governed by Turko-Mongol dynasties and tribes perhaps related to Tibetans. At their height, the T'u-yü-hun held some kingdoms along the Silk Route and raided Khotan. They were conquered by Tibet in the 7th century. The T'u-yü-hun seem to be the people known as 'A-zha in Tibet.

Central Tibet

According to most Tibetan histories, Yar-lung in central Tibet was the original home of the Tibetan people and was the center of the culture for hundreds of years. IHa-sa, just to the north, became the capital in the seventh century. Over the succeeding centuries, numerous towns, estates, and religious centers were established along the gTsang-po river and in the valleys of its tributaries. Many more place-names could be added to this map, which, for lack of space, shows only a few of the famous sites in central Tibet.



The Era of Gnya'-Khrl-Btsan-Po

In the middle of the third century B.C., Central Asian states of Khotan and Kucha were established, and the great Dharma King Asoka ruled India. The period of the Warring States in China was finally ended when the Ch'in dynasty united China, In the west, Seleucus, a general of Alexander the Great, had established an extensive empire, but the Parthian Persians soon became independent. Rome now controlled all of Italy, but was not to expand greatly for another century.

Ancient Indian Dynasties

According to numerous Tibetan histories, the first Tibetan king was descended from one of the royal Indian families in power at the time of the Buddha. Northern India in this era was divided into kingdoms known as Mahajanapadas, each ruled independently. From one of these old kingdoms, an Indian prince is said to have fled or been cast out, making his way across the Himalayas and into Tibet where he was given the ruling title of gNya'-khri-btsan-po.

The Development of Bon

The Bon tradition has undergone many stages of development, absorbing influences from foreign lands and later from the Buddhist tradition. Some histories note that Bon practices began during Gri-gum's reign, while others say certain Bon practices were then condemned. According to the Bon text Srid-pa'i-rgyud-kyi-kha-byang-chen-mo, Gri-gum's death was connected with the arrival of heretic Buddhists in Tibet. Other sources tell of the arrival of Bon-pos from 'A-zha or from Zhang-Zhung and Bru-sha during Gri-gum's reign, while new Bon teachings are sometimes said to have begun in the time of sPu-de-gung-rgyal.

The later Son tradition, which may be quite different from early Bon, contains nine divisions of teachings, the first four devoted to rituals and practices for healing, making offerings, burial rites, divination, and subjugation of negative forces. The other divisions deal with moral practices, meditation, and more mystical doctrines. It will require extensive research to be able to determine the earliest forms of Bon, what the Bon-pos from foreign lands brought into Tibet in Gri-gum's and sPu-de-gung-rgyal's time, and the effect on the folklore of the people.

Tun-huang documents offer material on ancient religious ideas and mythology, funeral practices, divination techniques, and various kinds of folklore. Later Bon texts, such as the Kha-byang-chen-mo, contain much old material on gShen-rab-mi-bo, the founder of the Bon tradition. His activities in Tibet, China, sTag-gzigs, India, and other regions are described, and the many different Bon lineages are explained. Cosmological ideas are also presented, together with descriptions of many gods-and spirits, and their relationships with human beings. A few Bon texts have recently been translated, offering Western scholars additional material to study.

Pre Buddhist Tibet

Religious and spiritual influences came not only through the Bon traditions, but from the very land itself. The rugged mountains and deep valleys displayed dramatic forms and shapes that served as natural symbols of a higher order, evoking the power of the cosmos.

The Buddhist tradition notes that certain locations were the home of Bodhisattvas and Arhats - hidden peaks such as rTsa-ri; the majestic mountain range gNyan-chen-thang-lha in central Tibet; the sacred lake Mansarovar (Ma-pham) near holy Mount Kailash (Ti-se). For untold centuries, pilgrims from India and the northwest had visited Ti-se and Ma-pham. Mantras and handprints of dakinis can be seen naturally impressed in the rock around this lake, and the water has curative properties. White peaks in the Himalayas such as Jo-mo-gangs-dkar (Everest) and Gangs-chen-mdzod-lnga (Kanchenjunga) were recognized as natural power centers, as were mountains to the north such as A-mnyes-rma-chen and gNyan-po-g-yu-rtse. Over the centuries long before Buddhist teachings reached Tibet, a way of life developed that was closely attuned to the land and its natural powers.

This ancient culture had been presided over by twenty-seven generations of kings up to the last bTsan king. These kings had ruled or six hundred and twenty years since the arrival of gNva -khri-btsan-po. With iHa-tho-tho-ri, the last of the bTsan kings, a new cultural era was to begin, one in which the Buddhist tejcrangs slowly began to influence Tibetan civilization.

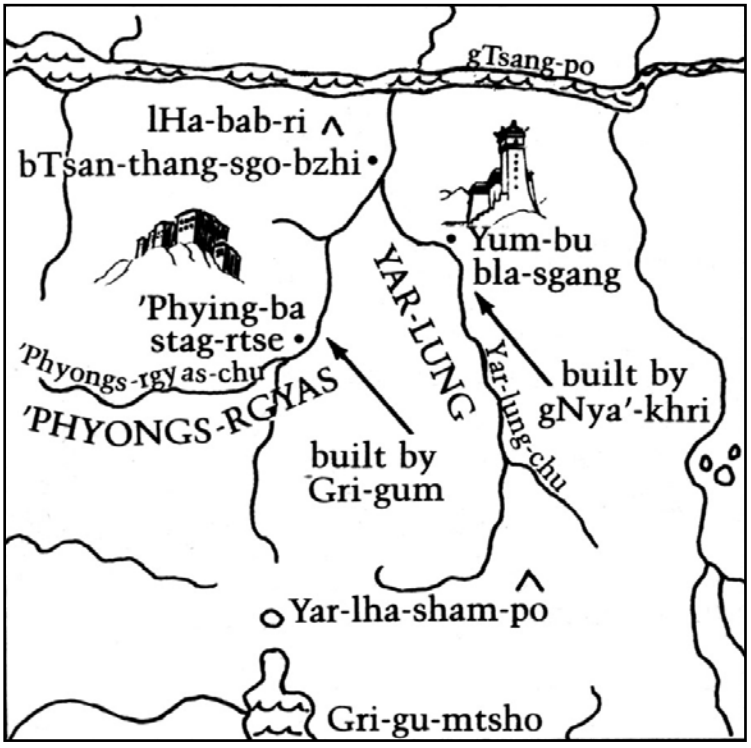
Trade Routes Across Ancient Asia

In 112 B.C. the Silk Route was opened across Central Asia. This trade route linked China and India in the east with Persia and Rome in the west. Goods flowed in both directions along

difficult caravan tracks, establishing trade and communication all across the Old World for the first time. But raiding nomadic tribes such as the Hsiung-nu made travel dangerous and threatened the new prosperity of kingdoms along the route, such as Khotan and Kucha. Han dynasty annals report that trade marts were also established in the northeast at Koko Nor.

Ancient Cultural Centers

The valleys of the Yar-lung and 'Phyongs-rgyas rivers became the center of the ancient Tibetan civilization. The first godlike king descended upon a mountain in Kong-po and made his way south to lHa-bab-rt From there, the new king went to bTsan-thang-sgo bzhi where he first met the Tibetan people. His castle of Yum-bu-bla-sgang and the castle of the eighth king at 'Phying-ba are located here, only in the 7th century was the capital shifted north to IHa-sa.



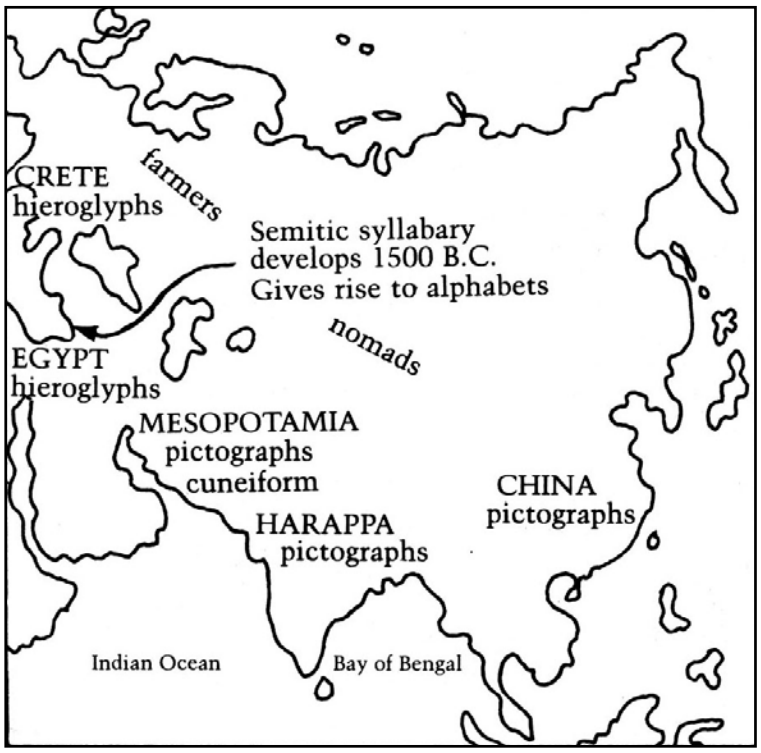
Exile and Return to Yar-Lung

The ancient principalities along the gTsang-po seem to have challenged the newly emerging kingdom established at Yar-lung. After the death of Grigum-btsan-po, the eighth king of Tibet, his three sons fled into exile to Kong-po, sPo-bo, and Dags-po while the usurper Lo-ngam ruled at Yarlung. One son defeated Lo-ngam and returned to the Yar-lung valley where he restored the dynasty as King sPu-de-gung-rgyal, another son became the White Prince of Kongr-po.

Part Three : The Empire

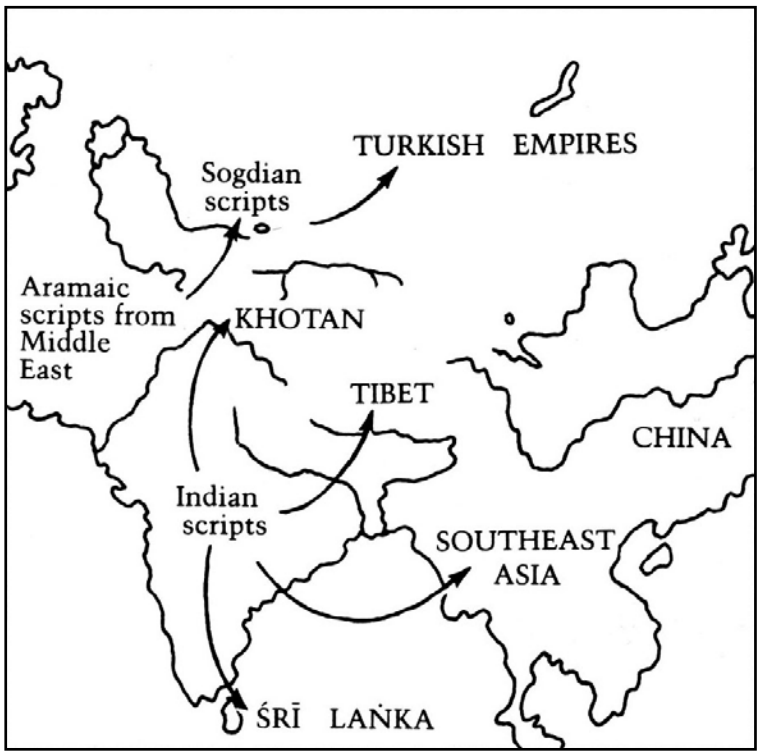
Ancient Scripts

Writing in the form of hieroglyphics, cuneiform, and pictographs was first developed in several centers of civilization in the ancient world beginning about 3000 B.C. Eventually alphabetic scripts arose in the Middle East and spread to the Greeks and Romans. Some of the Indian scripts may have been modelled on an alphabet from the Middle East; some scholars think Indian Brahmi script developed from the ancient Harappan script, which has not yet been deciphered.



Indian Script for Tibetan

The Tibetan alphabet was based upon one of the Indian scripts in use during the seventh century A.D, when Srong-btsan-sgam-po commissioned chief minister Thon-rni Sambhota to devise writing for the spoken language of Tibet. Ancient Indian scripts in - eluded Kharosthi, Brahmi, and related scripts such as those in the Gupta style. Indian models were also used to develop scripts for languages in southeast Asia, Sri Lanka, and in some Central Asian states.



Appendix - C

Sources for Further Study

Highlights of Tibetan history from ancient times up to the ninth century can be found in old Tibetan materials from Central Asia, inscriptions, edicts, and documents from the era of the Dharma Kings, as well as in Tibetan histories. Some of these Tibetan accounts have been translated into Western languages. Additional information can be found in Chinese records from the Han, Sui, and T'ang dynasties, and in Khotan texts and Arab accounts. Several modern works on Tibetan history contain interesting material on ancient times, while Western scholarly publications offer detailed discussions of specific issues. Scientific information on the development of the plateau can be found in scientific journals and publications from various academies of science and U.S. governmental agencies, and in the Beijing press.

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Glossary

Scientific Terms

DATING METHODS The chief method to estimate the ages of rocks and archaeological remains is radiometric dating. Most rocks contain radioactive atoms of chemical elements such as carbon, potassium, or rubidium. From their known rates of natural radioactive decay (half-life), the age of the sample can be calculated.

GEOLOGICAL TIME SCALE Dates for the earliest history of the earth are provided by radiometric dating. Periods after 5/0 million years ago when fossils become abundant can be denned by stratigraphic sequences of fossils. The bed in which a fossil is found can then be radiometrically dated to develop a timescale. These dates arc still being adjusted as new evidence is evaluated, and completely standard dates have not been agreed upon by researchers around the world.

GONDWANAL AND A cluster of ancient kind masses that formed the southern part of Pangaea. See Pangaea.

MEGALITHS Large stones set into the ground in various patterns in ancient times. These arrangements may have had religious or astronomical purposes.

MICROLITH1C TOOLS Small blades chipped from stone, used to make harpoons, spears, or other complex tools. Often associated with Middle Stone Age cultures that arose at the close of the Ice Age.

ICE AGE A number of ice ages have occurred in the history of the earth, the most recent one beginning 3.25 million years ago and drawing to a close about 12,000 B.C., though the present wanner period appears to be only an interglacial. Causes of this ice age seem related to variations in the earth's orbit, precession, and tilt. Climatic changes may also be related to reversals in the magnetic poles, variations in sea level, changes in the atmosphere, cosmic impacts, and the arrangement of continents.

MOUNTAIN BUILDING Intensive mountain building appears to take place at intervals in geologic history. These active periods are thought to correspond to the assembly of supercontinents as continental plates join together. Periods of active building are interspersed with lulls that appear to represent the completion of supercontinents.

PANGAEA A supercontinent that formed between 350 and 220 million years ago. The initial configuration was complete by 260 million years ago, and was followed by a westward slide that brought Africa close to North America by 220 million years ago. This is the "classic configuration of Pangaea." The breakup of the supercontinent began by 210 million years ago as the Atlantic Ocean began to open, separating the Americas from Africa and Europe.

PREHISTORIC PEOPLES Anthropologists have identified several types of prehistoric man. *Homo habilis* [2 million years ago]. *Homo erectus* (1.6 million years ago to 200,000 years ago), *Homo neandez-thalensis* (120,000 to 40,000 years ago), and modern Homo *sapiens* (40,000 years ago to present). A number of fossils intermediate between *Homo erectus* and modern man have been called archaic Homo *sapiens*.

STONE AGE Human culture opens with the Old Stone Age, the Paleolithic, beginning 2.5

million years ago and lasting until 10,000 years ago. The Paleolithic is divided into three eras. Lower Paleolithic early Old Stone Age): 2.5 million to 200,000 years ago; Middle Paleolithic (middle Old Stone Age): 100,000-40,000 years ago, - Upper Paleolithic (late Old Stone Age): 40,000-10,000 years ago. The Paleolithic is followed by the Mesolithic (Middle Stone Age): 10,000 years ago until farming practices began, marking the opening of the Neolithic (New Stone Age).

UPLIFT OF THE PLATEAU Though the Tibetan plateau had formed by 45 million years ago when India collided with Asia, rapid uplift did not begin until 2-3 million years ago. Experts offer different heights and rates of uplift. For example, according to different sources, the height of the Himalayas 3 million years ago was: 2000 meters; 3000 meters; 4000 meters; or even 5000 meters.

Appendix - D

Historical Terms

'A-ZHA A culture or kingdom connected with the bSe tribe according Tibetan records. 'A-zha was conquered by Tibet in the seventh Century. Modern scholars connect 'A-zha with the T'u-yu-hun people, who established a kingdom in the northeastern corner of the plateau in the fourth century.

A-MI MU-ZI-KHRI-DO The ancestor of the Tibetan tribes, according the Po-ti-bse-ru. His three different wives gave rise to the four great tribes of Tibet.

A-MSUVARMAN King of Nepal (r. 576-621), whose daughter Khri-btsan married Srong-btsan-sgam-po.

BON A religious tradition that was practiced in Tibet before the introuction of Buddhism. Bon lineages continue to the present time.

BRU-SHA The Gilgit region along the Indus river in modern-day Pakistan. It was part of the Tibetan Empire in the eighth century.

CH'ANG-AN Capital of Tang China. Invaded by Tibet in 763 A.D.

CH'IANG Tribes said by Han dynasty records to have been living west of China as early as 1500 B.C. T'ang dynasty accounts suggest they might be ancestors of the Tibetans. Ch'iang tribes still live in the eastern orderlands.

DATING SYSTEM The Tibetan dating system used since the eleventh century is based on cycles of sixty years. Within one cycle, each year is indicated by an animal and an element. Twelve animals are combined with five elements to give sixty unique year names, such as fire-dog or earth-horse.

'DUS-SRONG The thirty-sixth king of Tibet, great-grandson of Srong-btsan-sgam-po, and grandfather of Khri-srong-1de-btsan.

FOUR CULTURES See 'A-zha, Zhang-Zhung, Sumpa, and Mi-nyag.

GLANG-DAR-MA The forty-second king of Tibet, reat-grandson of Khri-srong-lde-btsan. His persecution of Buddhists temporarily halted royal support for the Dharma.

GRI-GUM-BTSAN-PO The eighth king of Tibet. Having cut the cord Connecting the kings to the sky, he was the first Tibetan king to die upon the earth. The first tombs date to his era.

GUNG-SRONG The son of Srong-btsan-sgam-po. He ruled Tibet for five years sometime before his father died.

HAN DYNASTY A dynasty ruling China between 202 B.C. and 220 A.D. Han records offer interesting information about the peoples around the eastern edges of the plateau.

LHA-THO-THO-RI The twenty-eighth king of Tibet, born 374 A.D. The first king to have contact with the Buddhist teachings.

HSI-HSIA See Mi-nyag.

'JANG See Nan-chao.

JO-BO-CHEN-PO Famous statue of the Buddha at age twelve, brought into Tibet by 'Un-shing Kong-jo.

KHOTAN An ancient Central Asian city-state, founded by the son of the Indian king Asoka in the third century B.C. Known as Li-yul in Tibetan records. Li-yul sometimes referred to the whole Central Asian Silk Route region. Records on Li-yul history contain valuable references to Tibet.

KHRI-BTSUN The Nepalese queen of Srong-btsan-sgam-po, daughter of Amsuvarman, king of Nepal. Also known as Bal-mo-bza' or Bal-bza'.

KHRI-SRONG-LDE-BTSAN The thirty-eighth king of Tibet. He established the Buddhist teachings as the religion of the land.

KIM-SHENG KONG-JO The Chinese queen of Mes-ag-tshoms, daughter of the prince of Yong, who was the brother of Emperor Chung-tsung (r. 705-710 A.D.).

LINEAGE OF KINGS Tibetan kings are commonly traced back to gNya'-khri-btsan-po, the first of the "Seven Khri." They were followed by the "Two sTengs," the "Six Legs," the "Eight iDe," and the "Five bTsan." IHa-tho-tho-ri was the last of the "bTsan." This line split after Glang-dar-ma. Forty-two generations are commonly counted, though different reckonings give forty or forty-one.

LITTLE KINGDOMS A group of twelve or more small kingdoms, rgyal-phran, that were in existence before the time of the first king, gNya'-khri-btsan-po, who united them. Lists of little kingdoms are given in many old documents.

MANG-SRONG The thirty-fifth king of Tibet, grandson of Srong-btsan-sgam-po, father of 'Dus-srong.

MANI BKA'-'BUM Text by Srong-btsan-sgam-po.

MES-AG-TSHOMS The thirty-seventh king of Tibet, the father of Khri-srong-lde-btsan. Also known as Khri-lde-gtsug-btsan.

MI-NYAG A culture or kingdom connected with the iDong tribe, according to Tibetan records. One Mi-nyag exists in the south around ICags-la and Dar-rtse-mdo; another existed in the north beyond Koko Nor in the eleventh century, and was known to the Chinese as Hsi-hsia.

MONKEY DESCENDANTS According to many Tibetan histories, the Tibetan people are descended from an unusual monkey and a rock demoness, a brag-srin-mo.

MU-NE-BTSAN-PO The thirty-ninth king of Tibet, son of Khri-srong-lde-btsan. His reign was very brief.

GNAM-RI-SRONG-BTSAN The thirty-second king of Tibet, father of Srong-btsan-sgam-po. Also known as Slon-mtshan.

NAN-CHAO A kingdom southeast of Tibet in modern-day Yunnan. Ally of Tibet until 789 A.D. Known in Tibetan records as 'Jang or IJang.

NONHUMANS Ancient rulers known as mi-ma-yin, including gods, demons, nagas, and other types of beings. They lived long before the time of the first king.

GNYA-KHRI-BTSAN-PO The first king of Tibet. 247 B.C. seems a likely date for his reign, though sources differ. His lineage, which endured until the ninth century, originated outside Tibet, according to most sources - in India or in the heaven realms.

ODDIYANA A region identified by most modern scholars with the Swat valley in modern-day Pakistan.

OD-SRUNG Son of Glang-dar-ma. He ruled portions of central Tibet after the fall of the Tibetan Empire in the mid-ninth century.

PADMASAMBHAVA The Oddiyana Guru invited to Tibet by Khri-srong-lde-btsan in the mid-eighth century.

PALA DYNASTY Ruling dynasty in Bengal and northern India in the late eighth and ninth centuries.

DPAL-'KHOR Son of 'Od-srung, who lived in the beginning of the tenth century. His son Khri-lde Nyi-ma-mgon left central Tibet and established kingdoms in western Tibet.

SPU-DE-GUNG-RGYAL The ninth king of Tibet, son of Gri-gum, who was exiled and returned to Yar-lung.

RAL-PA-CAN The forty-first king of Tibet, grandson of Khri-srong-Ide-btsan. Also known as Khri-gtsug-lde-btsan.

SAD-NA-LEGS The fortieth king of Tibet, son of Khri-srong-lde-btsan, who reigned after his brother Mu-ne died. Also known as iDe-srong and Khri-lde-srong-btsan.

BSAM-YAS The first Buddhist monastery established in Tibet. Founded by Khri-srong-lde-btsan, Santaraksita, and Padmasambhava.

SANTARAKSITA The Abbot of Vikramasila Buddhist university in India. He was invited to Tibet by Khri-srong-lde-btsan.

SILK ROUTE Caravan route across the Central Asian desert that opened in 112 B.C., linking east and west. Cities established in the oases along this route, such as Khotan, Kucha, Karashahr, Kashgar, became, prosperous, cosmopolitan centers.

SRONG-BTSAN-SGAM-PO The thirty-third king of Tibet. He laid the foundation for the Buddhist tradition in Tibet and began the expansion of the Tibetan Empire.

SUM-PA A culture or kingdom connected with the sTong tribe, according to Tibetan records. Modern scholars suggest that Sum-pa is connected with the Su-p'i tribes mentioned in old Chinese records.

T'AI-TSUNG The second T'ang emperor of China (r. 627-649). Famous as the virtual founder of the T'ang dynasty. His daughter 'Un-shing Kong-jo married Srong-btsan-sgam-po.

T'ANG DYNASTY The dynasty ruling China (618-907 A.D.) during the era of the Dharma Kings of Tibet. Annals kept by T'ang historians offer valuable information about Tibetan history of this period.

TA-ZIG The region of Persia. Also spelled sTag-gzigs.

THON-MI SAMBHOTA Minister of Srong-btsan-sgam-po. He was commissioned to devise an alphabet for writing the Tibetan language.

TIBETAN TRIBES The original Tibetan tribes included iDong Mi-nyag, bSe 'A-zha, sTong Sum-pa, and dMu Zhang-Zhung. Zla and dBas, as well as the Iha-rigs rGo, are sometimes counted as separate tribes. The leaders of each tribe were A-spo IDong, bSe-khyung sBra, sTong A-lcags

'Bru, and dMu-tsha rKa. Many variations in spelling can be found in different sources.

TUN-HUANG A city in Central Asia (about 500 miles northwest of Koko Nor) that came under Tibetan rule in the eighth and ninth centuries. Records in Tibetan found there in 1907 are a valuable historical source for ancient Tibetan history.

TUN-HUANG ANNALS' DATES The dates in the Tun-huang annals are recorded using only the animal symbol. But the exact date can be determined by comparison with other accounts. Well-known events, such as the invasion of the T'ang capital or the arrival of Kim-sheng Kong-jo, can be matched up, thus establishing that the year-by-year Tun-huang chronology opens with the dog year. The rest of the dates follow consecutively. See Dating System.

'UN-SHING KONG-JO The Chinese queen of Srong-btsan-sgam-po, daughter of T'ai-tsung, second T'ang emperor.

UIGHURS Turkish tribes northeast of Tibet who allied with T'ang China against Tibetan forces in the eighth and ninth centuries.

WESTERN TURKS Tribes controlling much of western Central Asia by the seventh century, though they lost ground to T'ang dynasty expansion. Allies of Tibet from the time of King Mang-srong. Included various tribes such as Qarluq, Nu-shih-pi, Tu-lu, and Turgish.

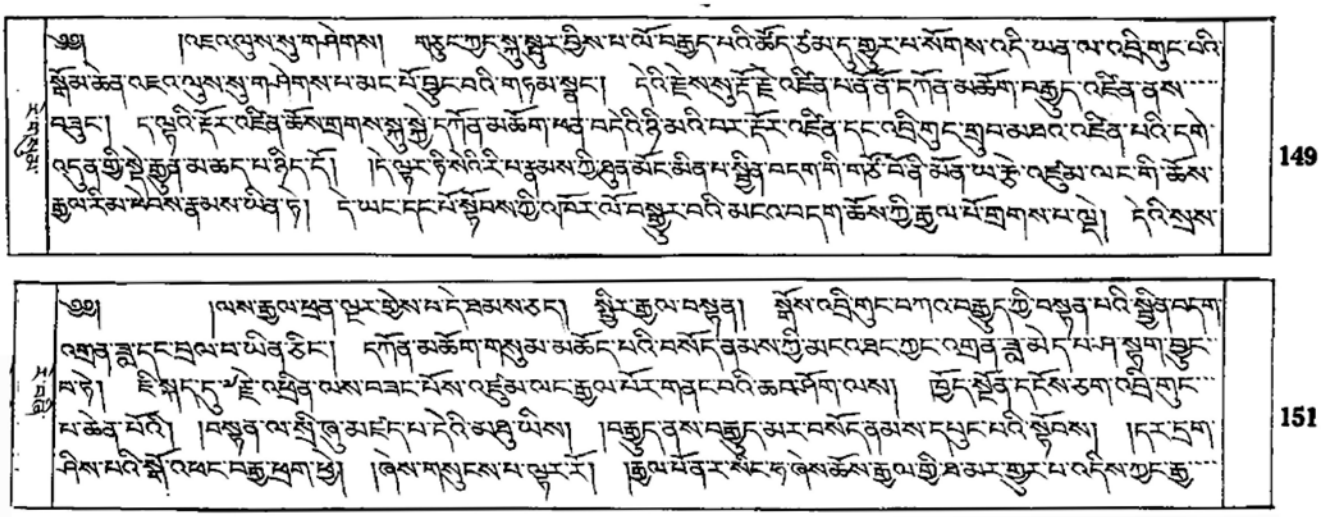
YUM-BRTAN Heir of Glang-dar-ma. He ruled part of central Tibet after the fall of the Tibetan Empire in the mid-ninth century.

ZHANG-ZHUNG A culture or kingdom associated with the dMu tribe, according to Tibetan records. Also often connected with Bon. Zhang-Zhung was located in western Tibet with its capital at Khyung-lung near Ti-se. It was conquered by Srong-btsan-sgam-po.

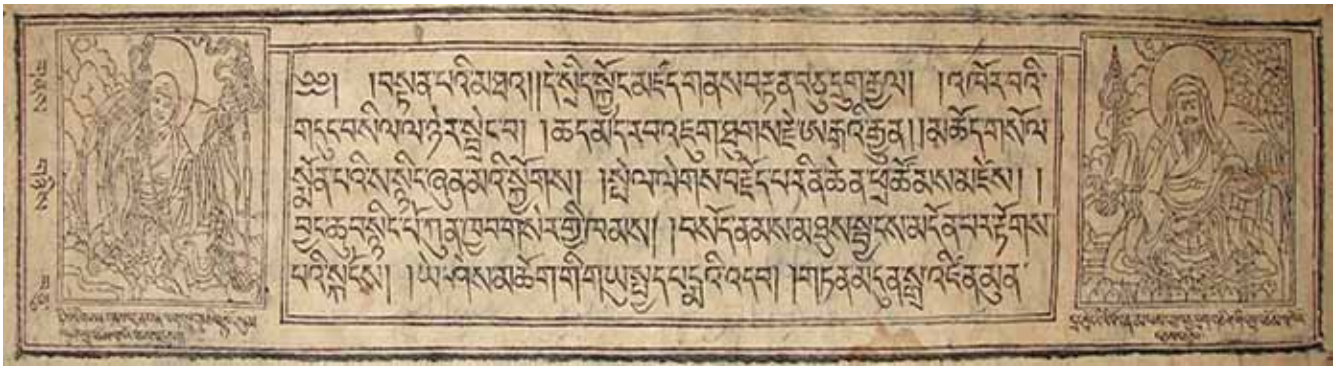
23 Translation from a pilgrimage guide to Mt. Kailash

Joseph McClellan

Kangri Karchak - An Original Page



There are a lot of Scriptures and Books written in Tibetan Language which mentions Rushabhdev and Shraman. Above is a page from Kangri Karchak, which is a religious book.



Tibetan Literature

Ref. Vol. XV Ch. 117 C Pg. 6850-6858

From a pilgrimage guide to Mount Kailash translation

Following a summary of the history of Hindu activity around Mt. Kailash, the author, a Buddhist, writes a chapter on the Jain tradition in the area:

As a supplement, if one wishes to know rough sketch of the Jain tradition, it is as follows: They are said to have a theoretical system that is a subdivision of the four eternalist schools of non-Buddhists in ancient India. This tradition was named Cherbu (gcer bu, "Naked Ones") who became known by that name because [its practitioners] abided in asceticism, staying naked, not wearing any clothes on their bodies. However, their other appellations were Thai ba'I gos can ("Clothed in Dust") and Phyogs kyi gos can ("Clothed in the Directions"). These days in India, they are called Jains. They lay tremendous emphasis on actions and their consequences. The householders of this tradition do not even eat meat, which goes without saying for the renunciants. Those in the early tradition remained exclusively naked [page 1], but later on, there were two traditions, one of which exclusively wore white garments. Other than the mere difference of wearing or not wearing clothing, there was not much theoretical difference between these two groups.

As these people hold that the entire world is the product of previous actions, they are similar, in part, to Buddhists. This system came about before the Bhagawan Buddha had come to the world. Among the twenty-four teachers of the Jains, the name of the first one is called Khyu mChog (Gopati). The last of them is called 'Phel ba or Mahavir.'

Mahavir was a contemporary of our own teacher. Those two even had some mutual connections. At that time in India there were many dissimilar theoretical systems, but if one were to summarize them, they would be subsumed under two main groups: those Vedic Hindus who maintained traditions of harmful sacrifice, and the Buddhists and Jains who maintained traditions of celibacy on a path of non-violence and peace. That tradition appears to be harmonious with Buddhism, and there are many practitioners of it these days in India. They adopt both asceticism and vows. They argue that asceticism exhausts previous karma, and that one attains liberation after cutting off later karma by means of vows.

Among the twenty-four Jain teachers, the first one, Khyu-mchog, or Ru-shob-Na-tha, engaged in arduous asceticism at Mt. Kailash, thereby gradually exhausting his past karma. By taking on vows that maintained the discipline of the ten kinds of virtue and by renouncing harm to even the tiniest creatures, he cut off future karma. It is said that he gained liberation near at the cliffs known as the Buddha's throne (sangs rgyas bzhugs khri) near the upper slopes of a monastery about two miles from the face of Mt. Kailash. That rocky mountain is also referred to in the Indian language as Asakrapadha. "Asakrapa" refers to the presence of eight tiers of rock terraces at that mountain, and "padha" means "place," or "level." He (khyu-mchog) is thus also referred to as the Protector Who Reached the Eight Levels.

His older son, Bharat, in the early part of his life, governing a city and establishing his hegemony, became a wheel-turning monarch. As his fame pervaded the ten directions, his kingdom also took on the name Bharat. In the latter part of his life it is said that, along with his younger brother Bahubali and nineteen relatives, he took monastic ordination and, together with many spiritual companions, travelled to Mt. Kailash to remain dedicated to asceticism and vows.

Moreover, during the time of the twentieth Jain teacher, Shri Munisuvrat Swami, it is said that tens of thousands of practitioners of his teachings accomplished the consummation of their meaning at the lake of Mt. Kailash. And in Lanka, land of the Rakshas, legend has it that the enemy of King Beng-ravana, King Valli, took monastic ordination and engaged in rigorous asceticism at this place. Then, King Beng-ravana also went to this supreme power-place and remained engaged in asceticism on the banks of the La-ngag Lake, such that the lake also came to be known as Ravana Lake or Rakshas Lake. The lake also came to be called ma-dros lake, mountain-god lake (la lha), and lotus-lake. Whatever it is called, the Extinguishers-the Jains-from the founding masters and their followers, have considered Mt. Kailash and its unsullied lake to be a liberating power place. The early histories and those that came later all say that by merely seeing, hearing, thinking about, or touching this place, and through the blessings of the holy masters, one will attain happiness in this life and accomplish one's wishes. It is appropriate to consider it a place that acts as the cause for future liberation. Even today, in an unbroken continuum, like a chain, pilgrims still arrive.

The meaning of their asceticism is as explained above, but if one were to give a small comment about their vows, they are the discipline of the ten virtues. Out of concern for harming small animals, they wear small bells on their feet. Out of concern for taking what is not given, they consume fire and the waters of desolate valleys. Out of concern for lying, they cut off speech and make no verbal expression. Out of concern for the tiniest of creatures present in the air, they cover their mouths with white cloth. In such ways they meticulously guard their karma.

The text continues with a brief history of the Ganges River and no further mention of Jains.

Conclusion

- I have spent time reading through Article 4 provided me, entitled "The Hook that Draws One Along the Path to Freedom: A Pilgrimage Guide to Mt. Kailash and Lake Mansarovar" and I did not find any relevant information on the Jain or Bon traditions.
- I am still going through Article 6, which is the Pilgrimage guide from the Library or Tibetan Works and Archives, written by the 6th Drigung Rinpoche (b. 1886 d. 1943). The pages are all out of order, so it is a bit slow going, but I have yet to find any relevant passages. It appears to be entirely Buddhist oriented.
- Article 2: Ironically, from the text titled, "The History of Tibet's Bon Monastic Estates and Their Current Condition" there is not much mention of actual Bon History. Under the short descriptions of the monasteries around Kailash, the author mostly relays their Buddhist history, such as when they were visited by such important figures as Atisha and especially Milarepa. The only explicit mention of Bon is the activity of Na-ro Bon-chung, who was most famous for losing his magic-competition with Milarepa. Moreover, Na-ro Bon-chung is sometimes argued to be an apochryphal figure invented by Buddhists. This draws into question the affiliation of the author, phun tshogstshe ring (b. 1936).

Note : We wish to thank Mr. Joseph McClellan for his help with translation.

24 Jain Religion in Tibet

Lamchidas Golalare

Ashtapad Maha Tirth or Kailash is the world's oldest Tirth situated in Tibet. Tirthankar Rushabhdev attained *Nirvana* on Ashtapad. The word "*Ling*" originated in Tibet. In Tibetan language meaning of "*Ling*" is area or (field), and meaning of "*Shiv*" is liberation (or free). So Ashtapad was the place of liberation. This mountain does not seem to be natural, it feels as if it is sculpted and carved by man. People of Tibet call it "*Kang Rimpoche* (*Rim Poche*)" or Nirvana place of Buddha. They worship this mountain with great devotion.

In the year 1807 Digambar Jain Lamchidas Golalare roamed in Tibet and wrote about Jains living in the area. Jains of *Sonavare* caste lived in Tibet, *Vaghanare* caste in *Mugar* area and *Mavre* caste in Arul city. He also discussed about the prosperity of Jains and number of temples in the area.

He saw many Jain temples in Khilvan city and Hanuvar city (country) situated in Tibet. From there he traveled to Kailash - Ashtapad. According to his writing and descriptions research for Ashtapad should be done in Tibet area only.

In recent times Tibet is known for Buddhist religion, but Buddhism entered Tibet in the 10th century. Before that what religion was precedent in the area needs to be researched a lot. Then one can say without doubt about the presence of Ashtapad in the area, which proves the influence of Jainism in Tibet.

Ref. Vol. VIII Ch. 49 F Pg. 3315

25 Tibetan and Hindu Mythology

Two versions of Kangri Karchhak, the Tibetan Kailash Purana, have been published in Tibetan, one from Dira-Phuk Gompa and the other from Gengra. Also two abstracts of these are printed and they are called Soldep. Kangri Karchhak says that Kailash is in the centre of the whole universe towering right up into the sky like the handle of a mill-stone, that half-way on its side is Kalpa-Vriksha (wish-fulfilling tree), that it has square sides of gold and jewels, that the eastern face is crystal, the southern sapphire, the western ruby, and the northern gold. It also says that the Peak is clothed in fragrant flowers and herbs, and there are four footprints of the Buddha on the four sides, so that the Peak might not be taken away into the sky by the deities of that region and four chains so that the denizens of the lower regions might not take it down.

The presiding deity of Kailash is Demchhok[1] (Dharmapala), also called Pavo. He puts on tiger skins and garlands of human skulls and holds damaru (Vibrant drum) in one hand and khatam (trident) in the other. Round Kailash are some more deities sitting in 990 rows with 500 in each. All these also put on tiger skins, etc. as Demchhok. The Shakti or the consort of Demchhok is Dorje-Phangmo or Vajra-Varahi, who is shown in Tibetan paintings and idols, clinging to him in inextricable embrace interlocked in sexual union. Adjacent to the Kailash Peak is situated on its western side a smaller snow-peak called Tijung, which is said to be the abode of Dorje-Phangmo. Besides these Lord Buddha and his 500 Bodhisattvas are said to be residing on the Kailash Peak. At the foot of the sacred Peak is seated Hanumanji, the monkey-god. There are also the abodes of several more deities around Kailash and Mansarovar. All these deities could be seen only by the pious few. Sounds of bells, cymbals and other musical instruments are heard on the top of Kailash.

There ae seven rows of trees round the Holy Mansarovar, and there is a big mansion in it, in which resides the king of Nags (serpent-gods) and the surface of the Lake is like an arc- with a huge tree in the middle. The fruits of the tree fall into the Lake with the sound jam; so the surrounding region of the earth is named ' Jambu-ling', the Jambu-dvipa of Hindu Puranas. Some of the fruits that fall into the Lake are eaten by the Nags and the rest become gold and sink down to the bottom.

At one place it is written that in the centre of the Jambu is the glorious mountain of Meru of Various colours; on the east it is white like a Brahmin; on the south it is yellow like a Vaisya;

1. Also pronounced 'Demchhok', a detailed account of which is given is Appendix II.

Ref. Vol. IV Ch. 24 B Pg. 1525-1526

on the north it is red like a Kshatriya ; and on the west it is black like a Sudra. Four mountains form buttresses to Meru and on each of these stand severally a kadamba tree, a Jambu tree, a peepal tree, and a fig tree.

Since the advent of Aryan civilization into India, Tibet and especially the Kailas-Mansarovar Region have been glorified in the Hindu mythology as part of the Himalayas. The Ramayana and the Mahabharata, all the Puranas in general, and Manasa-khanda[2] of Skanda Purana in particular, the glory of Mansarovar. It is the creation of the manas (mind) of Brahma, the first of the Trinity of the Hindu mythology; and according to some, the Maharaja of Mandhata discovered the Mansarovar. Mandhata is said to have done penance on the shores of Mansarovar at the foot of the mountains which are now known after his name. Recently the author has read the description of Achhodasara in Kadambari of Bana Bhatta. He feels that this lake cannot be any other but the celestial Manasa-saras. The description of Acchodasara is extremely interesting although it does not fully coincide with facts.

In some Pali and Sanskrit Buddhist works, Mansarovar is described as Anotatta or Anavatapta, Lake without heat and trouble. In its centre is a tree which bears fruits that are 'omnipotent' in healing all human ailments, physical as well as mental, and as such much sought after by gods and men alike. This Anavatapta is described in saying that lotus flowers, as big as the Amitabha Buddha, bloom in the Holy Lake, and the Buddha and the Bodhisattvas often sit on those flowers. Heavenly Rajahansas will be singing their celestial melodies as they swim on the Lake. On the surrounding mountains of the lake are found that Shata-Mulikas or hundred herbs.

In Jain literature Kailash is called Ashtapad. Aadinath Rushabhdev, the first Tirthankar of Jains, was said to have attained Nirvana at Kailash. In Mahabharata Mansarovar is also known as Bindusara and in Jain works as Padma Hrada.

2. The author has secured a manuscript copy of Manas-Khanda from Almora District. Though it claims to be a part of Skanda Purana, in fact it is not. It is not more than two or three hundred years old and is written by some Pandit of Almora. The author intends publishing it with a translation and foot notes.

26 Influence of Jainism on Tibetan Literature

Advayavajra is one of the celebrated authors of Vajrayana Buddhism. He is also known as Avadhati-pa. In Tibetan Tangyur many other epithets are given about him, such as, Pandita, Maha Pandita, Brahmana, Acharya, Mahacharya, Avadhuta, Upadhyaya, Bangalee etc.

"Advayavajra has above twenty two (22) works translated in the Bstan - gyur, but some of these works are also available in Sanskrit. Twenty two (22) small Vajrayanist tracts of his are edited by H.P. Shastri in the Advayavajra Samgraha."[1]

In the above mentioned sangraha, there is a very small tract or lreatisc of only twenty (20) slokas named mayanirukti. The colophon is silent about its author, but the Tibetan translation attributes its authorship to Advayavajra and translation to Upadhyay Vajrapani.

"Though Advayavajra is a famous and celebrated Vajrayanist author, his date is difficult to ascertain and this difficulty has been made more complicated by the supposition of the existence of more than one Advayavajra."[2]

Without entering into controversy whether there was one or more than one Advayavajra. It is better to conclude that the Vajarayanist author Advayavajra flourished during the latter half of the Pala period. More precisely during the 11^{th} century A.D.[3]

After a little digression let us concentrate upon the subject matter of "mayamukti" to have a glimpse of the religious condition of that age.

In his introduction to Advayavajra - samgraha. H.P. Shastri states that he does not venture to give an English translation of the work for several reasons : because the readings in many places so hopelessly corrupt that nothing can be made out of it: the sentences are so elliptical that it is difficult to make a gramatical construction. H.P. Shastri further comments that Advayavajra himself hated diffuseness and was a lover of brevity and in making his works brief he had made them enigmatical.

In spite of all these difficulties, H.P. Shastri has rendered a great service to the students and scholars of Indology by writing the summary of each of the tracts or treatises included to the celebrated collection: Advayavajra - sangraha.

1 R.C. Mazumder, History of Bengal. p. 406 f.n. 158.
2 lbid.
3 N.N. Dasgupta, Baglay Banddatharana. p. 74 B. Bhattacharya, Indian. Buddhist Iconography p. 48.

Ref. Vol. XV Ch. 117 E Pg. 6873-6878

"It (Mayaniryukti) treats of illusion and speaks of maya as magic. Some consider it to be magic and some think it to be true. For the satisfaction of the illusions, the Yogin may enjoy all good things of the world which come to him of their own accord, because he enjoys them as maya."

"But a true Yogin should have the Earth for his bed, the quarters for his cloth and alms for his food. He should have forbearance for all phenomena because they are not produced and his benevolence should be perennial"

On a perusal of the contents of mayanirukti it seems that there were two types of yogins or ascetics in Bengal at the time of Advayavajra - one type of Yogins or ascetics used to satisfy their sense - pleasures by the enjoyment of all good things of the world that would come to them automatically and the other type of yogins or ascetics used to observe a very strict code of discipline in regard to food, drink, dress, bed etc. It seems that the number of the second class or category of monks sharply dwindled in the Buddhist monasteries when Vajrayana and in its train sahajayana firmly struck roots in the Buddhist Church.

As the attainment of the "Bodhicitta" the state of "mahasukha" or surname bliss. Produced by the union of "Prajna" and "Upaya" was accepted by the Vajrayanist and the Sahajayanist Buddhist as the "summum bonnum" of life, strict monastic discipline in regard to food, dress and bed gave way to sexo - yogic esoteric practices in almost all Buddhist monasteries all estabilishments.[4] Consequently within a short time, the number of true Yogins or ascetics who observed strict monastic discipline sharply fell or decreased and in course of time the true Yogins were extinct.

So at the time of depicting the portrait of a true Yogin or ascetic, Advayavajra had before his eyes the spectacle of an advanced Digambara - Nirgrantha monk.

From the time of the origin of their religion, the Jina Kalpi or advanced Nirgrantha monks had to observe strict and stringent monastic codes for the attainment of liberation from the cycles of birth and rebirth.

In Mayaniryukti the criteria set for a true Yogin or ascetic by Advayavajra are found in the following couplet.

"mahi sayya diso vaso bhiksa bhaktam ca bhajanam |
Ajata dharmata ksantih kripana bhagavahini" ||

Does not this sloka bring to the mind's eye of the reader the portrait of an advanced Digambara Nirgrantha ascetic who was enjoined by the scriptures to use the earth for his bed. Quarters for his garment, and alms for his food? As for other two qualities of a true ascetic mention has been made of ksanti or forbearance and Kripa or benevolence kindness. Without the attainment of these two qualities none could be called an ascetic by the Digambara Jainas in ancient India.

The Nirgrantha ascetics since the inception of their religious organization had to bear all sorts of natural and man - perpetrated cruelties upon them with equanimity and forgiveness.

The *Acharangsutra* one of the oldest scriptures of the Jainas, vividly describes how Mahavir was

4. S. B. Dasgupta, Obscure Religious Cults, p. 31 ff.

cruelly treated by the inhabitants of Vajjabhumi of Radha. Instead of keeping dogs off from Mahavir the inhabitants of Vajjabhumi set dogs on the monk and made dogs bite him. But Mahavir did not carry bamboo sticks like other monks to keep off dogs from biting. In the 3rd lesson, eleventh couplet of the some book. It is said, "When he (Mahavir) once (sat) without moving his body, they (the rude villagers) cut off his flesh, tore his hair under pain or covered him with dust".[5]

"The venerable one (Mahavir) who had abandoned the care of the body, more pain free from desire".[6]

Not only did Mahavir endure himself such cruelties but he commanded his followers also to endure all troubles (parisaha) that are likely to beset them in their life as wandering mendicants.

It is also to be noted that one of the ten duties of a Jaina monk is to forgive the offenders. The Nirgantha (Jaina) monk from the day of their ordination to monkhood "learn how to control anger and instead of giving way to wrath, practice the difficult duty of forgiveness and the monks are constantly reminded of how Mahavir forgave his enemies" and the monks are also advised to remember how "the venerable one once forgave a wicked cobra that bit him and preached to it the noble virtue of forgiveness." [7]

The quality of benevolence or kindness for all living beings whether men or beast is ingrained in the religion of the Nirgranthas. As the Nirgranthas believe in the potential equality of all Jivas (souls) they refrain form hurting even an animalcule. On the other hand they rander all sorts of help for the protection of living creatures. It will not be out of place to mention that by the austerity called "vaiya - vacha". The Nirgranthas or Jainas render service to the poor, the helpless, the suffering by giving them food, water shelter or clothing."[8]

It is, therefore, evident from the discussion made above that at the time for depicting the characteristics of a true yogin or ascetic, Advayavajra had before him the model of an advanced Nirgrantha Digambara ascetic. And in the eleventh century A.D. perhaps, the Digambara ascetics were very numerous in North Bengal where at the Devikota Vihar, the author of "Mayaniryukti" Advayavajra had his residence. The ruins of Devakota/Devikota have been unearthed at Bangarh, eighteen miles away from Dinajpur.

Incidentally, it is to be mentioned that in the medieval times in Bengal some "Avadhutis" and Kapalis" were known for their strict and hard hermit life. As for example, the Avadhuti yogis lived in forest under trees, begged alms for food, put on wornout rags (Jirnacivara) and were averse to caste, scripture and pilgrimage"[9] But this description of the Avadhutis does not tally with that found in Mayaniryukti because the Avadhutis wore worn out rags and all Avadhuti ascetics did not live in forests some of them lived in monasteries As, for example, Avadhutipada Advayavajra himself lived at Devikota monastery'.[10] Probably in the eleventh century A.D. when the tract or treatise Mayaniryukti was written the Avadhutis were not yet organized into a sect and perhaps they were very few in number and not noticeable.

5. Hermann Jacobi. Acharangsutra, SBE, Vol. XXII
6. lbid.
7. Mrs. S. Stevenson, Heart of Jainism, p. 151 ff.
8. Mrs. S. Stevenson, Heart of Jainism, p. 167.

As regards the Kapali or Kapalika Yogis, it is said that they lived a nude life, besmeared their bodies with ashes, put on bracelets of bones on their necks, wore earings in ears. Wore anklets set with small balls and beat damrus or small tabours etc."[11] This description of the Kapali yogis is at variance with that found in 'mayanirukti'.

So we may conclude without hesitation that Advayavajra in depicting the characteristics of true Yogis or ascetics had before him the portrail of the 'Jinakalpi' or advanced Digambara ascetics who were well-known for their hard and strict monastic life and who were perhaps, very numerous at Devakota/Devikota at Kotivarsa Visaya in the Bhukti of Pundravandhana, (North Bengal) during the eleventh century A.D.

At the close of the discussion, three glaring truths have come out to light through the dark mazes of the Jaina-history of Bengal of the Pala period.

The first truth is that the religion of the Nirgranthas (Jainas) was not on the verge of extinction in Bengal engulfed by the rising tide of Buddhism as stated by some scholars or historians of repute.

The second truth is that the religion of the Jainas or Nirgranthas was still a living religion in Bengal vigorous in its existence and their monks were indirectly admired even by their opponents for the strict monastic life led by them.

The third truth is that the Pala Kings, who followed an eclectic religious policy, cannot be blamed for the disappearance of the jainas or Nirgranthas from the province of Bengal during the 12^{th} or 13^{th} century A.D. On the contrary, the liberal and generous religious policy of the Pala kings infused new strength and vigour to the Nirgrantha or Jaina community which found expression in the field of art and iconography that came to an abrupt end after the advent of the Turkish hordes in Bengal.

9. N.R. Ray, Bangalin Itihas, Aadiparva, p. 532.
10. N.N. Dasgupta, Banglay Baudhadharma p. 74.
11. N.R. Ray, Bangalin Itihas, Aadiparva, p. 541.

27 Milarepa Story

Milarepa Versus Naro Bonchung

All around the Mount Kailash Kora there are signs of the contest for supremacy that was fought between Milarepa, the Buddhist poet-saint, and Naro Bonchung, the Bon master. According to the Buddhists, in all encounters it was Milarepa who came out the victor, but despite this he still agreed to a final, winner-takes-all duel, a straightforward race to the top of the mountain. Mounting his magic drum, Naro Bonchung immediately set out to fly to the summit but despite his acolytes' urging, Milarepa didn't bother getting out of bed. Finally, as the first rays of dawn revealed that Naro Bonchung was at the point of reaching the top, Milarepa rose from his bed and was carried by a ray of light directly to the top. Shocked by this defeat, his opponent tumbled off his drum, which skittered down the south face of the mountain, gouging the long slash marking Mount Kailash to this day. Hindu pilgrims call the slash the 'stairway to heaven'. Gracious in victory, Milarepa de-creed that Bon followers could continue to make their customary anticlockwise circults of Mount Kailash, and awarded nearby Bonari as their own holy mountain.

Sights

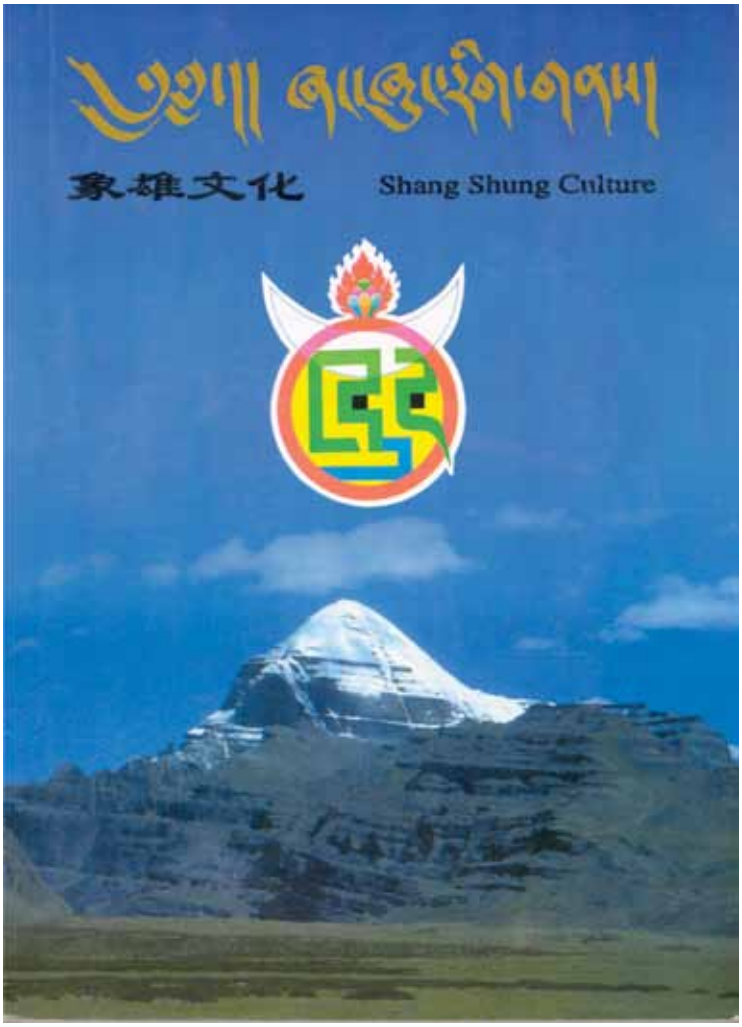
In the old part of town is the Mani Tsundu Temple. It's often closed and there's not much to see, but it's a pleasant five-minute walk to the temple and there are usually a few pilgrims around. To get there, take the road that branches off from the southern end of town.

The closest cultural sight to Nyalam is Milarepa's Cave (admission Y10) and Nyalam Pelgye ling, the small temple built over it. Milarepa was a famous Buddhist mystic and composer of songs who lived in the late 11th and early 12th centuries. During his long meditation in this cave he renounced all luxuries and survived on a diet of local weeds (famously turning green as a result). Milarepa is credited with many magical feats in Tibetan literature; one was raising the ceiling of his cave with his bare hands. You can still see his handprints on the roof.

·According to folklore, Milarepa's success thereby established Buddhism as the primary religion in Tibet. In return for Mt. Kailash, Milarepa gave to the Bon Pos a nearby hill, the so called Bonari. About one hundred years later, Gyalwa Gotsanga, opened the kora around Mt. Kailash for the public. On his kora he was led by heavenly beings including *Dakinis* and *Tara*sthat appeared in the form of various animals such as wolves and a female yak ('Dri'). They showed him the way around Mt. Kailash and let him the way to Drira Phuk for meditation.'

NOTE : Shri Gautam Swami climbed on Ashtapad 2600 years ago, as per Jain Scripture. While Milarepa climbed Kailash with the help of light - sunrays after 1400 years. Both the stories are very similar. Gautam Swami climbed looked for Moksha, while Milarepa climbed to defeat his opponent and then awarded Bon followers anti clockwise circuits of Mount Kailash and Bonari as their holy mountain.

28 Shang Shung Culture



A Note from Sajjan Jain: Preceding the Yarlung dynasty in Tibet, there was a kingdom called Shang Shung. We know of eighteen of its kings, but between the last of these and the first king of Tibet there is a long gap. Actually, we do not know the names of many of the kings of Shang Shung nor do we know anything of what they did, but we do know for certain that Bon was the official religion of the kingdom. The entire territory of present-day Tibet belonged to that kingdom, and its capital was located in the area of Mount Kailash. In the 1986 a German expedition reached the sacred area around Mount Kailash and filmed a documentary of the ruins of buildings and fortresses from the kingdom of Shang Shung. This film was broadcast by some European television networks. [Reinhard Karl The Dark Glow of the Mountains - Gasherbrum-Der Leuchtende Berg. One can view the film on the internet.]

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29 Records of early Han history

1. The known facts from Han history records

From the recent archaeology findings, there were wide spread settlements all over China, including Tibet, over 6,000 years ago. One could use the phrase '10,000 stars' to describe the situation. There were even some primitive written languages, one of them at Bon Po, which I had personally observed, Note that the settlement in Tibet may or may not be by Tibetans.

a) The relation between Shang people and Jian-Tibetan

At the time around 1,400 B.C., there was a semi-Tibetan people called 'Jian' mixed with Shang people. From the oracles, one see phrases as 'Today we captured 50 Jians' frequently. Certainly, some Shang people were captured by Jian, but not recorded. By the way, the Tibetan people were considered to be the descendent of Jian by some scholars in the past. Today, Jian and Tibetan are classified as one race, Jian-Tibetan people. Anyway, we are satisfied with the closeness of Tibetan and Jian.

One of the Kings of Shang Dynasty had a name Jian-Chia. For the convenience of the reader, I will use English alphabet A, B,.. to replace the Han ordering Chia, Yee,... So, let us call this King Jian-A. There were possible explanations of his name, may be his mother was a Jian, may be he was a Jian conqueror, i.e., he killed a lot of Jian, and was famous for his acts. However, there was no record of big battle between Shang people and Jian people at that time. I would rather think that his mother was a Jian, In any case, there were some inter-marriage between Shang people and Jian people who lived near each other.

Let us consider the life style of the two people. The name Jian has a root in Yion (goat, the animal 'sheep' was transplanted to Han people from Northwest during Han Dynasty, sheep was called Hu-Yion, and later Mion - Yion), which indicates that Jian was likely to be goat raising nomad. This observation checks with the later records of Jian people. On the other hand, Shang people were semi-nomad with settlements, as indicated by -

1. large amount of animal bones discovered in the sites of Shang people,
2. the animal decorations of bronzes, the associations of Yion (goat root) in Han Characters of beauty, taste good, etc.,
3. the fame that Shang people ate a lot of meat,
4. the constant movements of Shang people, one Shang King moved his capital 8 times.

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On the religions, both believed shamanisms and both use bone-oracles. In fact the ancient Tibetan written language I saw was carved on bones.

b) Later records of Jian-Tibetan

One thing I noticed is the resemblance of the classical Tibetan poems with Chuu-Shi (southern Chinese poems of 'Spring-Autumn' and 'Warring States' periods). Both are with 4-7 syllables with the middle syllable or the end syllable denote a sigh, and of comparable lengths.

From there to the Early-Han Dynasty, we have little records of Jian. The ambassador, Chang Chien, of Emperor Wu tried to come back to the capital of Han through Qinghai (Jian Land or Jian Chung) and failed. Jian assumed a peaceful life during that time. Later on, in the Later-Han Dynasty, there were troubles in Jian Land. It was largely a war between farmers and nomads. General Chao Tson-Kuo spent many years to safe guard the fertile corner of Qinghai. In fact, the battle continued for many generations and was indecisive. After the down fall of Later-Han, Jian people started moving towards the central China. During the South-North Dynastys, from the fourth to the sixth century, Jian and a relative, Tze, built several Kingdoms in the central China. These people cross married with the Han people of the northern China, and thus assimilated.

From now on we should turn to the history time of Tibetans.

30 Tibetan sources for the research of Ashtapad

Thomas Parmar

Since 2005 I have been working for Ashtapad Research. I had presented a paper titled, "The similarity between Lord Shiva and Bhagwan Rushabhdev", in seminar on Ashtapad arranged at Ahmedabad in January, 2005. After this seminar my interest for the location of Ashtapad increased. I was encouraged by Dr. Rajnikant Shah and Padmashri Dr. Kumarpal Desai to visit Library of Tibetan Works and Archives (LTWA) at Dharamsala (Himachal Pradesh) to find the references about Jainism and Ashtapad from Tibetan sources. Twice I visited LTWA (April 2006 and April 2009) and during my two visits I referred to some books on Tibetan history, culture, religion and archaeology and interviewed some scholars and officers of LTWA and Tibetan scholars at Dharamsala.

First visit to Library of Tibetan Works and Archives (LTWA), Dharamsala

The Project to find references of Ashtapad in Tibetan manuscripts

I was invited by Dr. Rajnikant Shah and Dr. Kumarpal Desai on 23rd Feb. 2006 to discuss about the references of Ashtapad in Tibetan manuscripts. We discussed in detail about the topic. They asked for my consent to visit the Library of Tibetan Works and Archives (LTWA) situated at Dharamsala (Himachal Pradesh) and to find the references of Ashtapad from the Tibetan manuscripts and books preserved in it. I expressed my willingness to go to Dharamsala for the project. It was decided that an expert would be provided to me who can read the Tibetan manuscripts and books and can explain to me in Hindi or English.

On 20th April, I reached Dharamsala with Shri Yogeshbhai Kothari of Shiv Darshan Adventure Pvt. Ltd. A Nepalese named Ngawang knowing Tibetan language had arrived at Dharamshala in the morning. He was sent by Kiran Lama - a Nepalese tour operator. After lunch we visited LTWA, there I met Sonam Topgyal, person in charge of the Manuscript Section. I explained to him the aim of our project. I requested him to help us find the manuscripts and books regarding the project and to suggest the names of local historians and scholars who have knowledge about our topic. He suggested two names: (1) Teshi Tsering La and (2) Ashang Tsering Choephel. From the library we went to see Mr. Teshi Tsering La. We explained to him in detail about the project. He listened to us carefully. He realized that we had come here to research the particular subject. He congratulated us for coming here so far from Ahmedabad and Mumbai. His suggestions for the project were as follows:

1. He had no information about the reference of Ashtapad in Tibetan manuscripts and added that there is no possibility of it.

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2. The references of Jain pilgrims who visited Ashtapad should be found in Jain Literature. Such references can be useful to get more information about Ashtapad and they should be arranged in chronological order.
3. This oral history of Ashtapad should be gathered from the local people of Tibet and the pilgrims to Kailash from Kashi. This oral history can enhance our knowledge and help in the research of the project.
4. Guide - books on Tibet should be examined, particularly the books written by the persons who traveled in Tibet, for example 'Seven Years in Tibet' and the books written by Swami Pranavanand etc.

On 21st April, Friday I reached the library with Ngawang but it was closed due to a staff picnic. Next two days - 22nd April (due to Second Saturday of the month) and 23rd April (Sunday) the library remained closed. On Friday I met Dr. Jampa Tsering a Tibetan medical practioner who is a friend of Ngawang. I spoke to him about the project. He advised me to see Ashang Tsering Choephel.

On 22nd April, Saturday we went to Ashang Tsering Choephel's house. He is 72 years old, unmarried and a religious man. He lives a simple life like a sage. He could speak and understand a little Hindi. A young journalist and secretary of Ngari Chithun Association - Sonam Dorjee was present during our meeting. He speaks and understands Tibetan, Hindi and English languages. He had little knowledge of Gujarati Language also. He was explaining our views to Ashang. From the discussion with Ashang we got to know the following details:

1. Ashang Tsering Choephel was living close to Mt. Kailash, so he knew each corner of that region, he lived there till 1959.
2. While he was living in Kailash region, he had often seen nude sages coming to Kailash for pilgrimage. The information about Ashtapad can be gathered from such persons who had seen the nude sages in Kailash region.
3. There is probability of the destruction of the valuable Tibetan books and documents during the Chinese takeover.
4. A book on Kailash - Mansarovar written by Lama Govind from Almora should be examined for the references of Ashtapad.

On 23rd April in the evening Yogeshbhai returned to Mumbai. On that day I visited a school named Tibetan Children's Village (Upper) where they were having Sports Day.

On 24th April, Monday I went to the Library and reached the Manuscript Section, Teshi Tsering La was present there. He showed me the manuscripts and books regarding Kailash and Mansarovar and mentioned the important pages. Thus, he helped me and many important pages were copied. We reached our room in the evening, I requested Ngawang to read and explain to me the copied pages. He tried, but could not. He was unable to help me decipher the text. I decided to take the help of a scholar of Tibetan language later on.

On 25th April, Tuesday I went to Library and found the following books and magazines regarding Kailash and Mansarovar :

Books :

1. Kailash - on pilgrimage to the sacred mountain of Tibet - Kerry Moran
2. Sacred landscape of the Himalaya - Eds. - Niels Gutschow, Alex Michaels, Charles Ramble and Ernst Steinkellner
3. Kailash and Mansarovar - After 22 years in Shiva's Dream - Rahul Kuldip Bedi and Subramaniam Swamy
4. Pilgrimage in Tibet - Ed. Alex McKay
5. Sacred Spaces and Powerful Places in Tibetan Culture - Ed. Toni Huber
   Important Chapters from last two books were copied.

Magazines (Regarding Tibetology)

1. Bulletin of Tibetology - Namgyal Institute of Tibetology - Gangtok, Sikkim
2. The Tibet Journal - Library of Tibetan Works and Archives, Dharamsala

Library - work continued for three days. We tried to gather all the possible information about Ashtapad from the local historians. It was not necessary to stay in Dharamsala hence on 26th April, Wednesday evening I set off on my return journey. On 27th April, reach Jaipur at 12-15 p.m. There I met Shri Dinesh Bhai and Shri Vimal Bhai Bordia.

During the field - work I could not get reliable and sufficient details about Ashtapad, but I am not disappointed. The field - work has opened new horizons for the research of Ashtapad. I would like to mention the following suggestions for the research of Ashtapad:

1. The suggestions of Teshi Tsering La and Ashang Tsering Choephel for the research of Ashtapad should be discussed and the needful should be done.
2. The help of Tibetan language scholars should be taken.
3. Tibetan manuscript experts should be involved.
4. The help of the following Tibetan scholars should be taken for the research and information about Ashtapad should be gathered from them. They are :
   i. Teshi Tsering La - Amnye Machen Institute, Meleod Ganj, Dharamsala (H.P.) 176219
   ii. Prof. Namkhai Norbu Rinpoche - University of Naples, Italy
   iii. Bhikkhu Pasadik - Phipp's University Marburg, Germany
   iv. Michael Henss - Swiss art historian, scholar and writer
   v. Franz Karl Ehrhard - Lumbini Research Institute, Nepal
   vi. Charles Ramble - Faculty of Oriental Studies at the University of Oxford, England
   vii. Ernst Steinkellner - Vienna University, Austria
   viii. Alex McKay - University College London, England
   ix. Toni Huber - Professor, Institute for Asian and African Studies at Humboldt University, Berlin, Germany
   x. Tsepak Rigzin - A Tibetan scholar and author
5. The following institutions may co-operate for research :
   i. Library of Tibetan Works and Archives, Dharamsala, Himachal Pradesh, India Phone: 91-1892-222-467 ; www.ltwa.net

ii. German Research Council (DFG), Germany
iii. Lumbini Research Institute, Nepal
iv. Institute for Asian Studies at the Austrian Academy of Science, Vienna, Austria.
v. International Institute for Asian Studies, Leiden, Netherlands.
vi. Central Institute of Higher studies, Varanasi, India.

6. The research articles on Ashtapad should be collected from magazines like Bulletin of Tibetology, the Tibet Journal and others.
7. International seminar on Ashtapad should be arranged and Jain, Buddhist and Tibetan scholars should be invited to participate in it.
8. We should involve Archaeological Survey of India (ASI) for the research.
9. Satellite imagery can be useful for the research.

During my stay at Dharamsala I visited local museums but I could hardly see any archaeological remains of Jainism.

The remains of submerged Dwarka are found with the help of Marine archaeology and the flow of the lost Sarasvati River is found with the help of satellite. Then why are we unable to find any trace of Ashtapad described in Jain Literature? Even if we cannot find it, it does not mean that it does not exist. If we consider the Mount Kailash as Ashtapad then question arises where Sinha Nishadhya Prasad would have been located on it built by Bharat Chakravarti? If it is covered and is under the ice then it might be possible to find. The news published in Sandesh - a Gujarati daily (Dt. 19th April, 2006) lead us to believe that Ashtapad does exist, as per the similar news like this.

Japanese scientists found ten lac years old piece of ice from Antarctica below 3 Kms. It took two and half years for the research. The piece of the ice is preserved at room temp of - 20 degrees Centigrade at the National Research Institution in Tokyo, Japan.

Second Visit to LTWA, Dharamsala

The project to find references of Ashtapad & Jainism in Tibetan Literature

For the above project first I visited Library of Tibetan works and Archives (LTWA) at Dharamsala (Himachal Pradesh) during 20th April 20 to 26th April, 2006. Second visit to LTWA was arranged during 22nd April 2009 to 1st May 2009. Mr. Maheshbhai Parmar and Dr. R. Shah also joined us. During this second visit we focused on the library work and visited local Tibetan Scholars.

Library Work

During our stay at Dharamsala we were attending the library daily. (Except Second and fourth Saturdays and Holidays) we referred 35 books to find the references about Jainism and Ashtapad in Tibetan culture. The following information was collected.

1. Three manuscripts were referred:
   i. Sources for history of Bon - Compiled & edited by Tenzin Namdak

      This manuscript contains the historical account of the Bon Po Vinaya and biographies.

ii.,iii. A detailed history of the Bon religion, with a survey of Bon Po monasteries in Tibet (vol. I & II) by Dpal - Ldon - Tshul - Khrims

The six great Bon Po Lama lineages, the creation of the Universe etc. chapters are important.

2. 'Ancient Tibet' (Dharma Publishing) was very useful for the project. Many charts, maps and tables are published. For example tectonic plates of the world, sea floor spreading, formation of plateau, mountains and rivers in Tibet, the theory of evolution, Tibet and neighbouring environments, pre-historic sites in Tibet, etc. These charts and maps throw light on geological, physical, religious, cultural and historical Tibet. Evidence based on genetic mapping suggests that modern human might have first arrived in west of Tibet and north India. Early modern humans lived in the Tsaidman basin on the north edge of the plateau as early as 33,000 B.C.

3. 'The Blue Annals' (ed. By George N. Roerich) provides the following information :

   i. During the time of Uposadha (Gso - Sbyon-phags) men became known as "palm-legs" (Tata-jangha, Ta-lairkan) During the reigns of six kings human life lasted for 10000000000000000000000000000000 (1 and 30 zeroes) can we put this period to the age of Rushabhdev ?

   ii. On pages no. 12 and 227 there is the word 'Jina" (rGyal-ba-can) It is the name of a person.

   iii. On page no. 16 there is the name of Jina-rsabha (rGyal-ba khy-mchog)

   iv. On pages no. 5,13 and 15 there is the name of Nimi or Nemi. This is the name of king.

   v. On page no.13 the name of Bharat (rGyas-byed) is given.

4. 'Maps of the Profound' (Jam-yang-shay-ba's great Exposition of Buddhist and Non-Buddhist views on the nature of reality by Jeffrey Hopkins, (University of Virginia) provides the following information :

   i. The author treats 12 renowned non - Buddhist schools. Among them one is nirgrantha (The Unclothed) (Ti. Gcer bc pa) also known as Jina (followers of Jina,Ti rgyal ba pa).

   ii. Other words and names related to Jainism : Jinata (rgyal ba dam pa), Rushabhdev (khyumchog), Arahatas (mchod' odpa), parivrajakas (kunturgyu).

   The author was born in 1648 in Tibet. Thus his work belongs to the 17th century A.D. Therefore it clears that the Tibetan people were familiar with Jainism.

5. The Encyclopedia of Tibetan symbols and Motif's by Robert Beer is a very interesting book which contains hundreds of line - drawings with explanation.

Symbols like Lotus Thrones, *Kirtimukha* (the face of glory), Hood of Serpents, *Airavat* (the elephant with six tusks) Mirror, Wheel and Deer, the eight auspicious symbols - a Parasol, a pair of Golden Fish, a treasure Vase, a Lotus, a white - right - spiraling Conch shell, an endless knot, a banner of victory and a golden wheel etc. are adopted in Buddhism of Tibet. Some of symbols among these are similar to Jainism. On this base one can conclude the prevalence of Jainism in Tibet.

Interviews

For the project we interviewed some scholars and officers of Tibetan secretariat at Dharamsala.

1. The most important visit was with Mr. John Vincent Bellezza a well-known Tibetan scholar and visiting Scholar, University of Virginia, USA. He has been researching in this area since 1983 and a well - known author on Tibetology with number of books to his credit. Among them 'Divine Dyads', 'Zhang Zhung' and 'Spirit-mediums', sacred mountains and Related Bon Textual Tradition in upper Tibet' are well-known. We met Mr. Bellezza on 23-4-2009 for the first time. We discussed in detail about the project and upcoming trip to Kailash.
2. We met the following people for the project and translation of the Tibetan manuscripts and books related to the project.
   i. Venerable Lhakdor (Director, LTWA)
   ii. Venerable Ani Norzom (Nun and a teacher in Tibetan Language)
   iii. Sangye Tandar naga (publication officer, Research & Tibetan publication Dept.)
   iv. Wangdu Tsering (Dept. of Oral History)
   v. Officer, The council of Religious Affairs
   vi. Thinlay (Under Secretary, Dept. Of Religion and Culture)
   vii. Dr. Chok Tenzin Monlam (Head, Research and Translation Dept.)
   viii. Jampa Dawa (Hindi translator, Research and Translation Dept.)
   ix. Tenzin Gyaltsen (English translator, Research and Translation Dept.)
3. Scholars and Institutions for Tibetology :
   i. Prof. David Germano (University of Virginia, USA)
   ii. Chhimed Rigdzin (Prof. of Tibetan, Shantiniketan West Bengal, India)
   iii. Lobpon Tenzin Namdag (widely recognized as the foremost Bon Scholar)
   iv. Kalsang Namgyal of Mustan, Nepal - is scholar of Zhang Zhung language)
   v. Prof. Satoa (Dept. of Buddhism, Delhi University)
   vi. Bon Cultural Centre - P.O. Kotla Panjola Via, Oachghat, Solan Dist. Sirmur (Himachal Pradesh, India) - 173223
   vii. Tibet House Museum; 16, Jor Bagh, New Delhi, India

Some of the scholars and officers advised us to visit the Bon Po Monastery in Dolanji at Solan and Tibetan University at Sarnath for further research. Therefore we decided to visit The Bon Po monastery at Dolanji (H.P.) in the near future.

Tibetan Literary and Archaeological source for the research of Ashtapad

Kailash is recognized as a spiritually significant by the followers of the Jain religion. In Jain writing Kailash is called **Ashtapad.** It is reputed to have been the place where Rushabhdev, the first *Tirthankar* attained *Nirvana* or Liberation with ten thousand monks. The gods cremated his body there - Mount Kailash became the first cremation ground of the world period (*sushama-sushama*). Rushabhdev's son King Bharat, considered the first *Chakravarti* of India, built a temple named *Sinha nishadhya* on Ashtapad. He also attained his liberation there by fasting to death.

Thus in the Jain tradition Kailash is considered as a *tirth*. The mountain is mentioned in their hagiographies under the name of Ashtapad as the first liberation mountain. Kailash is located on high plateau lands of Western Tibet, near the meeting point of the present day Chinese, Indian and Nepalese frontiers. The snow - capped 6,714 meter - tall mountain is known to Tibetans as Ti-se (or Gangsdkar Ti-se) while most non - Tibetans call Mount Kailash. Just to the south of it lies the sizeable lake of m Tsho Ma-pham (or mTsho Ma-dros-pa and Ma-pang for Bon-pos), also called Lake Mansarovar. Tibetans call Mt. Kailash also as Demchhok Kangripoch of Dharmapala. Demchhok is the main deity of the Kailash.

In Jain writings there are detailed descriptions of Ashtapad and most Jaina scholars like Hemchandracharya consider Kailash as Ashtapad. *Vividha tirth kalp* refers Mansarovar close to Ashtapad. To discover the exact location of Ashtapad and to prove Kailash as Ashtapad we should study the Tibetan studies also. The Tibetan studies includes (1) Tibetan writings (2) Tibetan archaeological sites (3) Tibetan culture and religion (4) Descriptions of Kailash written by travelers and (5) Research work on Tibetology.

A. Tibetan writings

Tibetan literature, derived from ancient oral tradition and consisting in myths and legends about the origin of the country and people, genealogical lists of its kings, state records, ritual texts, etc. The Tibetan books though made of paper did not follow the scroll format of China but adopted the palm - leaf format of India. An honorific description for a Tibetan loose-leaf book is poti (skt. Punthi - Pustika). It is well known that one bundle of Tibetan loose leaves may contain more than one book, sometimes twenty to thirty tracts.

1. The Dunhuang Tests

The manuscripts were obtained in 1907 by Aurel Stein in a long, sealed cache in the Buddhist cave at Dunhuang in the Gansu province of China. These Tibetan texts from Dunhuang were probably written in the 8th and 9th centuries. As far as they go, the texts reflect essentially the same outline of Tibetan history that is found in the later and more complete historical works.

2. Kanjur and Tanjur

King Trhisong Detsen (755-797) established a collection of texts in his palace and the same was done in various monasteries. This collection was edited by Boston. The entire body of texts is divided into two parts. (1) The first part is bkagyur (pron. Kangur, here is spelled kanjur) which means "translation of the world) (bka) (2) The second part is the bs Tan Gyur (pron. Tengyur) which means translation of treaties. The complete kanjur and Tanjur published in 1981 in 120 volumes.

3. Chronicles (Gyelrap)

In this category, the Bod kyi rgyal rabs (pron. P oki Gyelrap) was written by the Sakya-pa lama Grags pa rgyal mtshan (1147-1246). It contains the Tibetan History.

4. Annals (Tepther) (Debther dmar po)

Important annals (debt ther, pron. Tepther) include the Red Annals (Tepther Marpo) and Blue Annals. The Red. Annals were composed in 1346 by Kun dga' rdo rje (pron. Kung Dorje).

The Blue Annals (Tepther Ngonpo) was composed between 1476 and 1478 by the scholar and translator Gos lotsava.

5. Religious Histories (chosjung)

The term chos 'byung (Pron. Chhojung) means literally "history of doctrine". Tibetan chos being equivalent to Sanskrit" **'dharma'.** Among this category the work was finished in 1347. Author has taken references from Kanjur and Tanjur. The entire work is in three parts. Lama Taranatha has written also the history in 1608. A history of the Eastern Mongols entitled "The bejeweled summary of the origin of Khans" was completed in 1662 by Sagang Sechen (Sagang the Wise). This work begins with an account extending from the creation of the world to the death of Buddha. This matter is important to trace out the life during Rushabhdev's time.

6. Bon History (Tenjung) (bstan' byung)

Bkra shis rgyal mtshan (pron. Trashi Gyentsen) wrote Lek shadzod (means Treasury of Good sayings). The work fully reveals the origin of Bon. The work is composed in seven sections. The first is about the origin of the universe, which is outstanding to know the culture during Rushabhdev's time.

7. The Biography of Shenrap Sidrid

The biography of Shenrap included in the Bon Kanjur is an example of such a work. The biography is known in three versions.

8. Guide books (Lamying and karchag)

The Tibetan Buddhist guide book called lam yig (pron. Lamyig) meaning "road description" and dkar c'ag (pron. Karchag) meaning "guide to holy places" were primarily intended for the use of pilgrims on their visit to sacred localities. The important guide books are as follow :

a. The Temples of Lhasa is a guide to Lhasa, which was composed by the fifth Dalai Lama, Ngawang Lopsang Gyatsho (1617-1682). It describes the temple on the Iron Hill and the Potala Palace on the Red Hill.

b. The Shamba la'i lam yig (pron. Shambala Lamyig) or description of the Road to Shambala was written in 1775 by the Third (or sixth) Panchen Lama, Lopsang Pelden Yeshe (1738-1780).

c. Dzamling Gyeshad is geography of the world in general, likewise names the author as Lama Tsenpo. The date of the composition is 1820. It described religious places, important persons, events and legends connected with the places. Finally there is a very important Guide to the Holy Places of Central Tibet.

d. A Tibetan Guide for Pilgrimage to Ti-se and mTsho Mapham. This 'Guide-book' (gnas-bshad), was written for pilgrims visiting the mountain and lake, composed nearly 100 years ago. It provides various local representations of the mountain and lake. The full Tibetan title is of two lines, the short margined title is Te-se gnas bshad. It was written in 1896. The original comprises of a total of seven chapters. Chapter six and seven are useful for our research project. An article titled 'A Tibetan Guide for Pilgrimage to Ti-se (Mount Kailash) and mTsho Ma-pham (Lake Mansarovar)' is written by Toni Huber and Tpepak Rigzin (Sacred spaces and powerful places In Tibetan Culture, Ed. By Toni Huber).

9. Manuscripts and Printed Books

Tibetan hand written manuscripts were probably on palm leaves imported from India. They were preserved in the library of the Potala in Lhasa. The Kanjur was First printed in Peking in 1410-1411. The first printed editions made in Tibet were produced at the Nathang monastery, the Kanjur in 1731 and the Tanjur in 1742. The printing was done from carved wooden blocks and the loose printed pages were placed between oblong boards and tied together to make the volumes. LTWA at Dharamsala (H.P.) contains the manuscripts of Kangri Kachhak (Acc. No. 2378) which is the guide to the pilgrims to Mt. Kailash and to Lake Mansarovar. I have collected its copy.

B. Tibetan Archaeology

Archaeologist like John Vincent Bellezza (visiting scholar, University Virginia, U.S.A.), Professor Guiseppe, Hugh Richardson have researched in Tibetan archaeology, Among them the work of John Vincent Bellezza is noteworthy. In 2003 he excavated the pre-Buddhist Paleo cultural zone traditionally known as Zhang-Zhung. He discovered the existence of Shang Shung, an ancient civilization based in northern and western Tibet. Shang Shung flourished until circa 1300 years ago. According to legend Shang Shung flourished in Tibet before the introduction of Buddhism in the seventh to ninth centuries. The home of Shang Shung is the Changthang, the remote north and west of the country and the highest, coldest and driest part of the Tibetan plateau.

Professor Giuseppe Tucci, Hugh Richardson, the British Resident in Tibet, and Russian Scholar George Roerich are in a better position to explore Tibet's ancient past. They uncovered a variety of pre-Buddhist archaeological sites including the remains of forts, megalithic sites and graves.

During the culture Revolution many archaeological monuments along with ancient monasteries and other culture sites were ruthlessly destroyed. But in 1976 the Beijing Academy of science mounted an expedition to Tibet to collect Stone Age tools lying on the surface. In the 1980s among the most notable work done Chinese archaeologists was the excavation of the Neolithic villages of Karou in the Chamdo Prefecture of eastern Tibet and Chukhong located in the Lhasa valley. The 1980s also saw the discovery and preliminary excavation of New Stone Age (1500-300 B.C.), Metal Age (1500 B.C.-Seventh century A.D.) and Imperial Era (618 A.D.-850 A.D.) tombs in several parts of the country. In the early 1990s, Chinese and Tibetan archaeologists studied more than 50 rock art sites in the Changthang. In the last several years they have turned their attention towards extreme western Tibet where a number of Buddhist and Pre -Buddhist finds have been made.

In conclusion it can be said that the study of Tibetan literature and archaeology will be able to throw some light on the research of Ashtapad.

Note: More articles and information on Tibetan religion, art, history and culture can be found on www.earlytibet.com, www.ltwa.net, www.tibetoralhistory.org and www.tibetarchaeology.com.

31 Study of Jain and Tibetan Symbols

Thomas Parmar

In Tibetan Art, *Chakra* (Wheel), *Kirtimukha* (the fac of Majesty), *Nagas* (Snakes), *Padma* (Lotus), *Matsya* (Fish), *Kumbha* (Vase), *Shankha* (Conch), and *Darpana* (Mirror) are very popular as symbols. We can also see these symbols in Jain art. Both arts have a close affinity between them.

Ashtamangal or **ZhaxiDaggyai** (Tibetan: བཀྲ་ཤིས་རྟགས་བརྒྱད།, Wylie: *bkra-shisrtags-brgyad*, ZYPY: ZhaxiDag'gyä; Chinese: 吉祥八宝, 扎西达杰) are a sacred suite of **Eight Auspicious Signs** endemic to a number of Dharmic Traditions such as Hinduism, Jainism, and Buddhism. The symbols or "symbolic attributes" (Tibetan: ཕྱག་མཚན།, Wylie: *phyag-mtshan*) are yidam and teaching tools. Not only do these attributes, these energetic signatures, point to qualities of enlightened mindstream, but they are the investiture that ornaments these enlightened "qualities" (Sanskrit: *guna*; Tibetan: ཡོན་ཏན, Wylie: *yon tan*). Many cultural enumerations and variations of the Ashtamangal are extant.

Nomenclature and etymology

Ashtamangal (Sanskrit: *ashta*, "eight"; *mangala*, "auspicious"; Devanagari: **अष्टमंगल**) or the Eight Auspicious Objects or Signs are endemic to a number of cultures including Buddhist symbolism, etc. The Eight Auspicious Signs are pronounced in Tibetan somewhat like "Tashi Tag-gya" (Tibetan: བཀྲ་ཤིས་རྟགས་བརྒྱད, Wylie: *bkrashisrtagsbrgyad*.

1. Chakra (Wheel)

The wheel is an ancient Indian Symbol of creation - sovereignty, protection and the sun. The Tibetan term for Dharma Chakra (choskyi khor to) literally means the wheel of transformation or spiritual change. The hub of the wheel symbolizes moral discipline and the eight spokes point in eight directions. Shasandevi Chakresvari bears two wheels in her two hands. Vidhyadevi Chakresvari also holds four Chakras in her four hands. We find the depiction of Chakra flanked with two deers on the *pitha* of the idol of *Tirthankar*.

2. Kirtimukha (the face of Majesty)

The *Kirtimukha* (-face of majesty, fame or glory) is commonly known as the monster mask. In Tibetan art it is seen on armour helmets shields and weapons of war. It is often painted across the upper beams of temples walls. In Jain temple it is depicted on the two sides of the threshold (*udumbar*). The frieze of *kirtimukha* is also decorated on the *pitha* of the Jain temple.

Ref. Vol. XX Ch. 151 F Pg. 8713-8727

3. Nagas (Snakes)

We find number of depictions of *Nagas* (Snakes) in Tibetan art. They are depicted separately or with god or goddess. In one depiction god is hooded with seven snakes. It reminds us of Parsvanatha who is always depicted with a snake's hood. The *Naga* (Snake) is *Lanchhan* (*Chinha*) of Parsvanatha. Parsvayaksha is also hooded with snakes and he bears two *Nagas* in his two hands.

4. Padma (Lotus)

The Lotus is a symbol of purity, renunciation and divinity. It is found depicted on the *pitha* of idols in Tibetan and Jain arts. It is the *Lanchhan* of Padmaprabha Swami.

5. Matsya (Fish)

Fish is one of the eight auspicious symbols of the *Jain tradition*. *Matsyayugal* means a pair of Fish commonly regarded as sacred in the orient on account of their elegant beauty, size and life span. We find many of representations of fish in Tibetan art. The vehicle of Kinnar Yaksha and Kandarpa Yakshi of Dharamanatha is a Fish.

6. Kumbha (Vase)

It is also one of the eight auspicious symbols of Jain tradition. It is a model on the traditional Indian clay water pot or *Kumbha* with a flat base, round body, narrow neck and fluted upper rim. Tibetan vases are very ornate. The *Lanchhan* (*chinha*) of Mallinatha is *Kumbha*.

7. Shankha (Conch Shell)

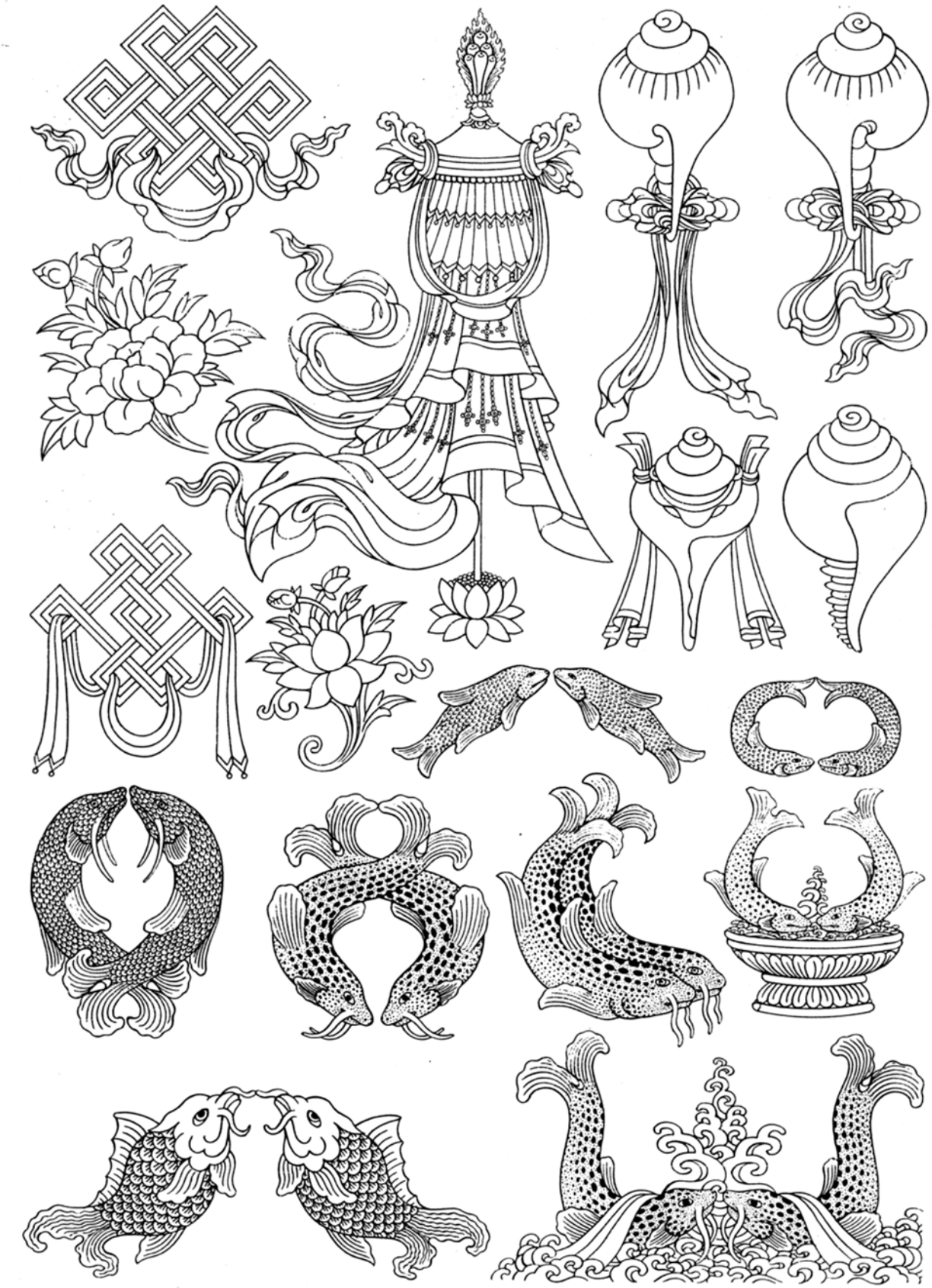
The conch is also considered auspicious It appears in the group of eight auspicious symbols. There are five common liquid perfumes used in Tibetan Conch-Shell offerings. The *Lanchhan* of Bhagwan Neminath is Conch. Sometimes Chakresvaridevi is seen carrying conch in her hand. In Tibetan art we find 32 types of Conch.

8. Darpana (Mirror)

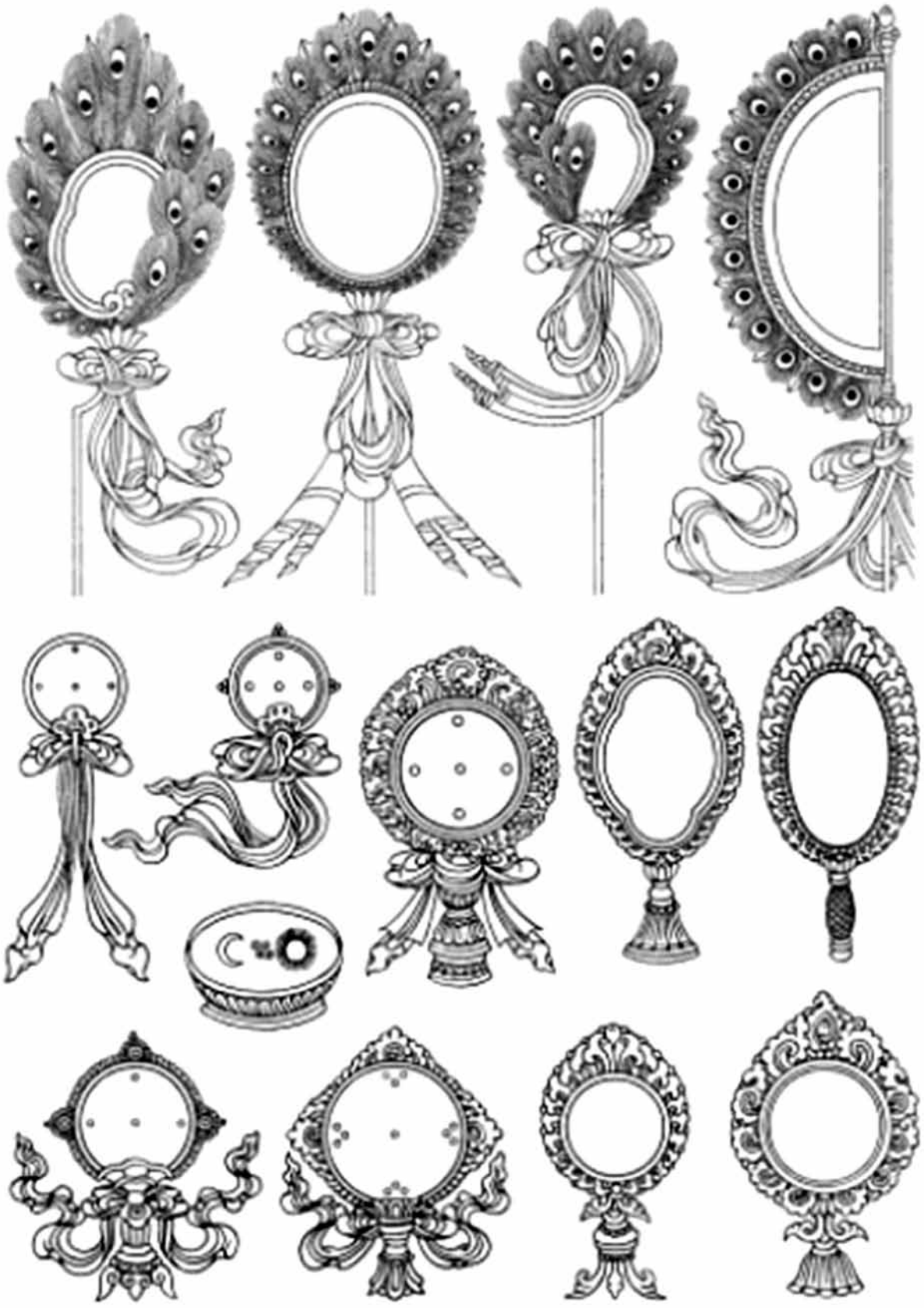
Darpana (mirror) also appears in the group of eight auspicious symbols. It is the perfect symbol of emptiness or pure consciousness. In ancient Indian rituals of cleansing or bathing a sacred image, the reflection of the sacred image in Mirror would often be washed by pouring water over the mirror. This rite is known as *Pratibimba*, which literally means reflection. In Tibet this ritual is known as the bathing ceremony of the deity.

The above study clarifies that some of these symbols are common in Jain and Tibetan art. It paves the way to find out the similarity between Jainism and Bon Po - ancient religion of Tibet.

Tibetan	Shwetambar	Digambar
1. Chakra (Wheel)	1. Swastika	1. Parasol (Chhatraratna)
2. Kirtimukha (the face of Majesty)	2. Sri Vatsa	2. Banner (Dhvaja)
3. Nagas (Snakes)	3. Nandavarta	3. Vessel (Kalasha)
4. Padma (Lotus)	4. Vardhmanaka (food vessel)	4. Whisk (Chauri)
5. Matsya (Fish)	5. Bhadrasana (seat)	5. Mirror (Darpana)
6. Kumbha (Vase)	6. Kalasha (pot)	6. Seat (Sukhasana)
7. Shankha (Conch)	7. Darpan (mirror)	7. Fan
8. Darpana (Mirror)	8. Meen Yugala (pair of fish)	8. Vessel



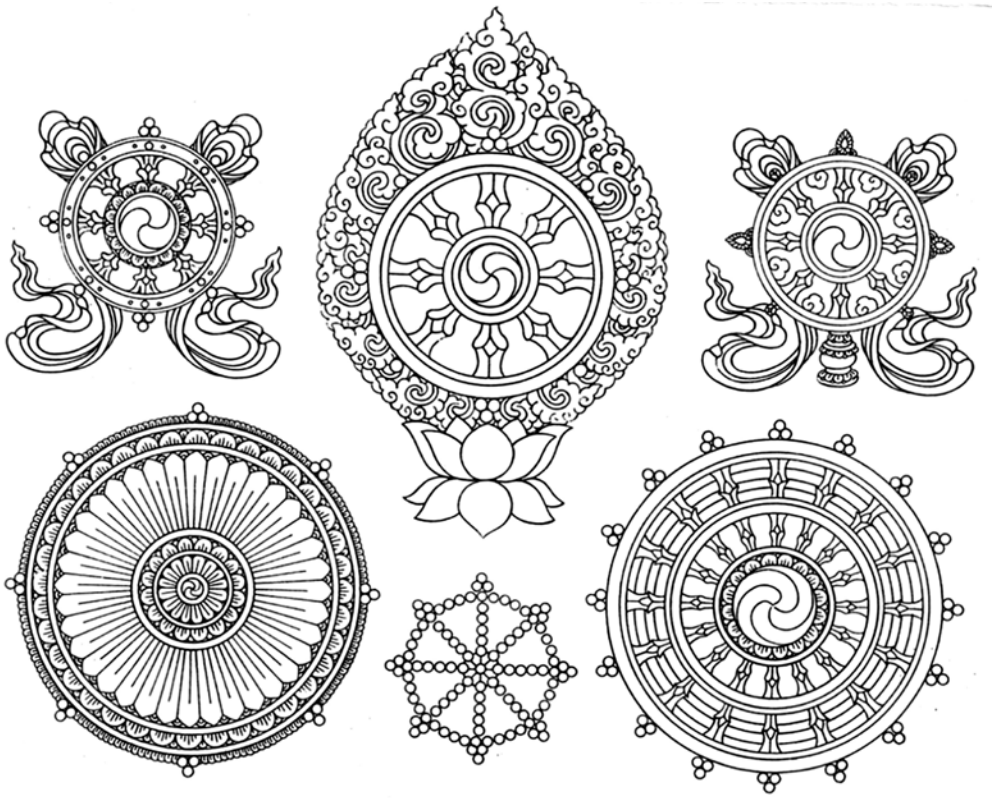
Variations of some of the eight auspicious symbols - Shankha (conch) and Matsya (fish)



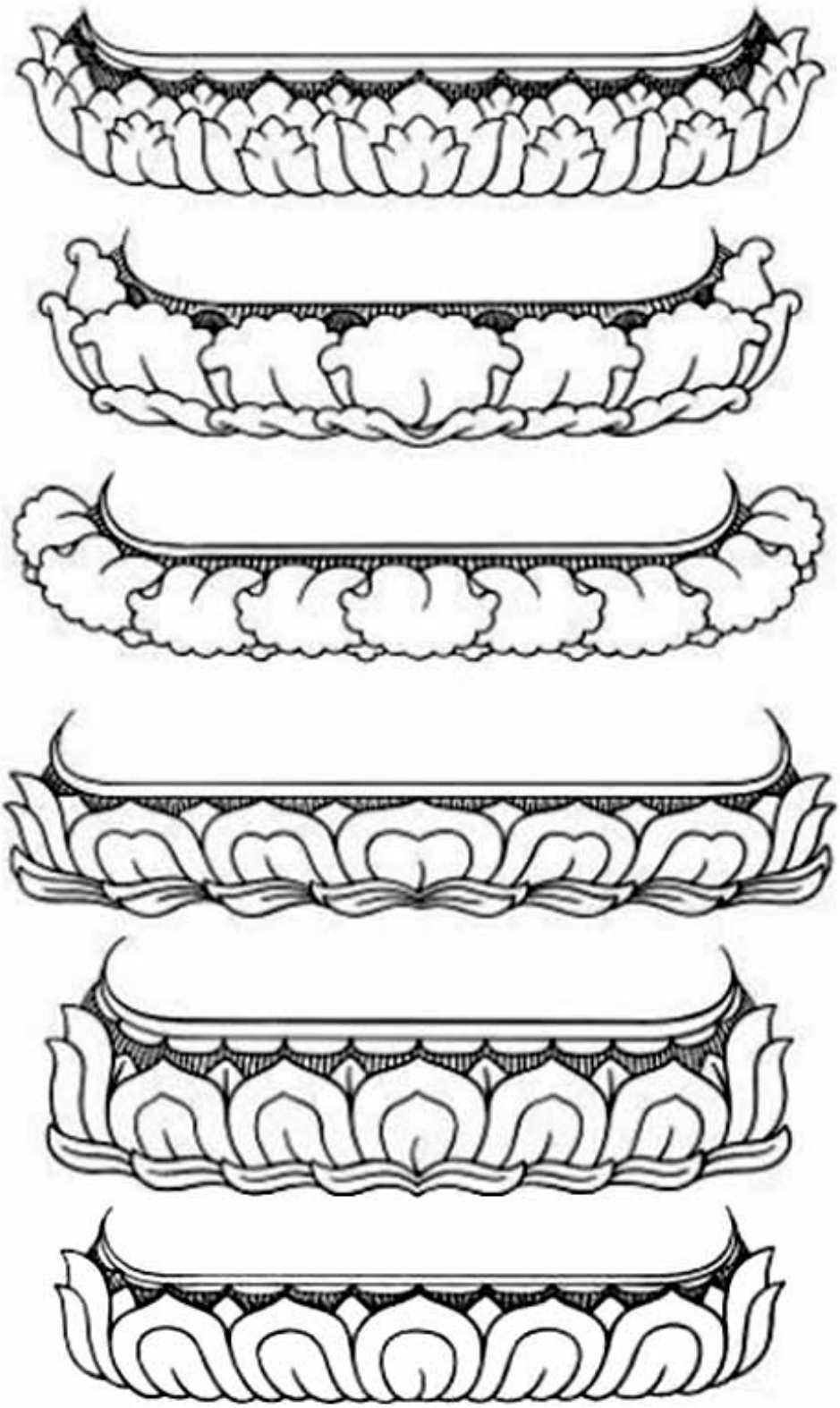
Offering of Sight - Darpana (mirror)

The eight auspicious symbols in Tibetan Religion

Nagas (snakes)



Chakra (wheel)



Lotus thrones

32 Glossary of Tibetan words

Some of the Important words & meaning of Tibetan Language used frequently in the tour of "Kailash Mansarovar"

કૈલાસ - માનસરોવર યાત્રામાં
જાણવા યોગ્ય કેટલાક તિબેટી શબ્દો, ઉચ્ચાર અને અર્થ

ખંગબા = ઘર	Kh'ngaba = Home
ગોમ્પા = બૌદ્ધ મઠ	Gompa = Buddhist Convent
ઉર્કો-કોંગ = મોટો વાઈસરોય	Urko-kong = Big Size of Cup & Saucer
ઉર્કો-યોક = નાનો વાઈસરોય	Urko-yok = Small Size of Cup & Saucer
ઓમા (હોમા) = દૂધ	Oma (homa) = Milk
કંજૂર = ભગવાન બુદ્ધનો શ્રી મુખવચન ગ્રંથ જેના ૧૦૮ ભાગ છે	Kanjoor = Loard Buddha's "Shree Mukhvachan Granth", which has 108 volumes.
કંગરિમ્પોરે = પવિત્ર કૈલાસ	Kangrimpoche = Pious Kailash
કંગરી = હિમનદી, કૈલાસ	Kangri = Glacier of Kailash
કરા = સાકર	Kara = Sugar
કિયંગ = જંગલી ઘોડો	Kiyong = Wild Horse
કુન-શોક્-સુમ્ = સોગંદ,પ્રતિજ્ઞા	Kun-shouk-soom = Oath, Promise
કુર = તંબૂ	Kur = Tent
કુશોક = સાહેબ, શ્રીમાન	Kushhok = Mister
કોરલો = હાથમાં લઈ ફેરવવાનો (જપ કરવાનો) મણિમંત્ર ઘૂઘરો	Korlo = To tell (one's) beads
કોરા = પરિક્રમા	Kora = Circumambience
ખમજમભો = નમસ્કાર	Khamjambho = Greetings
ખંપા = "ખમ" નામના સ્થાનમાંથી આવેલા ને ભારતમાં વસેલા તિબેટી	Khampa = Tibetans who arrived from "Khum" but residents of India
ખતક = દેવતા, લામા અને અફસરોને માળાની જગાએ આપવામાં આવતા પાતળા કપડાના લાંબા ટુકડા	Khatak = A long piece of thin cloth used instead of garland made of Pearl by Tibetan Buddhist Priest & Officers to tell one's beads
ખી = કૂતરું	Khi = Dog
ગંગરી = હિમનદી, કૈલાસ	Gan'gari = Glacier of Kailash
ગરપન = વાઈસરો	Garpan = Saucer
ગોકપા = તિબેટી લસણ	Gokpa = Garlic grown in Tibet
ગુટંગ = નેપાળી મહોર (નાણું)	Gutounge = Currency of Nepal
ગોપા = ગામના મુખી	Gopa = head person of village

Ref. Vol. XV Ch. 117B Pg. 6834-6848

ગોરમા = રૂપિયા	Go'ramo = Money
ગ્ય-ગર = ભારત (સફેદ મેદાન)	Gya'gar = India (white soil (land))
ગ્ય-નક = ચીન (કાળું મેદાન)	Gya'nk = China (black soil (land))
ડરી = પશ્ચિમ તિબેટ	Dari = West Tibet
ડાટો = ગઈ કાલે	Dato = Yesterday
ડીમા = દિન	Dima = Day
ચંપા = સત્તુ	Champa = Flour parched barley, wheat
ચક્તક = સાંકળ	Chaktak = Chain
ચકંગ = નિત્ય પૂજાનું દેવમંદિર	Chakang = A place where you worship (temple)
ચમ-કુશોક - શ્રીમંત	Cham-Kushok = Rich, Wealthy
ચિમા-કરા = મોરસ	Chima-kara = Sugar
ચેનરેસી = અવલોકિતેશ્વર	Chainresi = God
ચેમા નેંગા = પાંચ રંગની રેતી	Chema-Nenga = Colourful Sand
ચોંગા = પૂર્ણિમા	Chonga = Full moon day
ચોમો = ભિક્ષુણી	Choma = Female beggar (medicancy)
છક્-છલ-ગંગ = જ્યાંથી સાષ્ટાંગ-દંડવત્-પ્રણામ શરુ કરીને પ્રદક્ષિણા કરવામાં આવે છે તે સ્થાન	Chak-Chal-Gng = place where to bow down flat and start circumambulation
છંગ - જવનો દારૂ	Chang = A wine made of Whole barley
છંગપો છમ્પો = મોટી નદી	Chagpo Chamapo = Big river
છંગરિંગ = ભેટ	Changring = Gift
છન = રાત્રી	Chan = Night
છરબા = વર્ષા	Charba = Rain
છાનાદોર્જે = વજૂપાણી	Chanadorje = Water for household use
છાસૂ = કરવેરા લેનાર અમલદાર	Chasu = Tax collection officer
છૂરા =દૂધ કે દહીનં સુકાવીને બનાવેલ ટુકડાઓ	Chura = Pieces made of dry milk or yoghurt (curd)
છૂ = પાણી, નાળું, નદી	Chu = Water, Canal, River
છૂમર = ઘી	Chumer = Ghee (clarified butter)
છોંગરા = મંડી, બજાર	Chongra = Market
છો = તળાવ	Cho = Lake, Pond
છોરતેન = સ્તૂપ, સમાધિ	Chortain = Stoop, trance, grave, tomb
ગંગબા = હંસ	Gangaba = Swan
ડુલ = ચાંદી	Dool = Sliver
ચંબા = મૈત્રેય	Chamba = Friendship
ચકટા = દીવાસળી	Chakata = Match-Stick (to let fire)
ચમ = કેટલું	Cham = Quantity(How Many / How Much)
ચેમા = રેતી	Chema = Sand
છા = મીઠું	Cha = Salt
છેમે = ઘીના દીવા	Che'me = Lamp enlightened with ghee (clarified butter)
જમ્બયંગ = મંજુશ્રી	Jamb'young = Manjushree (A name)

જબ = અર્ધો ટંકા (નાણું)	Jab = 6% Interest per annum [A half of tanka (Currency)]
જા = ચા	Ja = Tea
જંબૂ = તિબેટની જંગલી ડુંગળી	Jimbu = Onion which is grown on a wild plant of Tibet
જોંગ, જોંગપન = ગવર્નર	Jong - Jongpun = Governor
ઝબ્બુ = તિબેટી યાક અને ભારતીય ગાયથી ઉત્પન્ન એક જાતનો શંકર બળદ	Zabbu = Child of Tibetan yak and Indian cow, Ox Breed
ટંકા, ટંગા = ભારતીય બે આના બરાબર તિબેટનો ચાંદીનો સિક્કો	Tan'ka, Tan'ga = It is equal to two paise of Indian currency, Silver coin
ટિમા = મલાઈ	Tima = Cream (Fatty part of Milk)
ટુલકુ લામા = અવતારી લામા	Tulaku Lama = Incarnation Buddhist Priest
ટે = ખચ્ચર	Te = Mule
ઠુઆં, ઠુમા = એક પ્રકારની વીર્યવર્ધક ઔષધી	Thuaa, Thuma = A type of Energetic Medicine
ટ્રમા = વટાણા	Trama = Green Peas
ડજંગ = ગોમ્પાના (બુદ્ધ-મઠના) પ્રધાન વ્યવસ્થાપક	Dajung = Chief head who takes care of the Buddh Convent
ડમા = લીલું હોવા છતાં સળગે તેવું એક જાતનું કાંટાળું જાળું	Dama = Green colored with thorns & yet can catch fire.
ડાબા = સાધારણ ભિક્ષુ	Daba = Ordinary Beggar (Saint), Junior, priest
ડુક = ભુતાન રાજ્ય	Dook = Bhutan State
ડૂ = જવ	Doo = Barley Whole
ચે = ચોખા	Ch'a = Rice
ડેમો = ચમરી ગાય	Demo = Type of Cow
ડો= જાવ	Dou = Go
ડોકપા = તિબેટી ભરવાડ	Dokapa = Milk Man of Tibet
ડોખંગ = ધર્મશાળા	Dokhang = Hospice/Pilgrim's rest house
ઢક = છ ટકા જેટલા થાય તેટલા નેપાળી રૂપિયા	Dhak = Amount of Nepal currency equivalent to six tanka (local currency) of Tibet.
તંજૂર = શાસ્ત્રોના અનુવાદના ગ્રંથ, જેના ૨૩૫ ખંડો છે	Tanjoor=Translated Granth(Volumnous Book), which has 235 volumes.
તજમ, તરજમ, તસમ = પોસ્ટ માસ્તર અથવા પોસ્ટ ઓફિસ	Tajam, Tarjam, Tasum = Post Master or Post Office
તમચોક ખંબબ્ = ઘોડાના મુખમાંથી નિકળતી નદી અથવા બ્રહ્મપુત્રા નદી	Tamchouk Khbbab = River which flows out from a horse mouth or Bramhaputra River.
તરોચક = રંગબેરંગી ઝંડા અને તોરણ	Tarchouk = Festoon / Arch
તરા = મટ્ઠો (જાડી છાશ)	Tara = Thick Butter Milk
ટમો = ઠંડી	Tamo = Cold (Chilled)
જીલબ = ભેટ	Jilab = Gift

તા = ઘોડા	Ta = Horse
તિસી = કૈલાસ	Tisi = Mount Kailash
તો, દો = પત્થર	Tou, dou = stone
થંકા = ચિત્રપટ, કપડા પર બનાવેલાં રંગીન ચિત્રો	Than'ka = Colourful Painting drawn on Canvas
થંગા = અધિત્યકા, પહાડના ઉંચાણ પર આવેલ સપાટ પ્રદેશ	Than'ga = Table-land
થુકપા = સત્તુ, છૂરા અને માંસ વડે બનાવવામાં આવતું તિબેટી ખાણું	Thukappa = A Tibetan Non-Vegetarian Food
દંગ = આવતી કાલે	Dung = Tomorrow
દલાઈલામા = ગુરુસમુદ્ર, તિબેટના રાજા	Dalai lama = King of Tibet / Priest who is next to god for Tibetan
દાવા = માસ	Dava = Month
દુક્ = છે	Duk = I do have
નમકંગ = અમાસ	Namkang = Last day of the dark half of a month
નનિંગ = ગયા વર્ષે	Naning = Last Year
ન્યીમા = દિન, સૂર્ય	Nyeema = Sun, Day
પુરમ = ગોળ	Puram = Round
ફીગ = સેવ	Fig = A salty preparation (Gram Flour, Shredded & fried)
કુક = ગુફા	Cuk = Cave
પો = ધૂપ	Po = Sunlight
પો, પોયુલ = તિબેટ	Poyul = Tibet
પોમો = સ્ત્રી	Pomo = Women
ફગબે = લોટ	Fag'be = Wheat Flour
કુલદો = અગ્નિમાં પકવેલ સોડાખાર	Kuldo = Sodium bicarbonate
બોત બોદ-યુલ = તિબેટ	Bota, Boda-ul = Tibet
મડંલ = એકના ઉપર એક એવી રીતે રાખેલો દસ-પંદર પત્થરોનો ઢગલો	Mandal = A bunch (10-15) of stones placed one above another
મણિ = ઓમ્ મણિપદ્મે હું મંત્ર	Mani = "OM Manipadhya Hum" Esoteric Formula / Vedic Hymn
મપચા, ખંબબ્ = મોરના મુખમાંથી નીકળતી નદી-કરનાળી નદી	Mapacha, Khambb = River which flows out from a Peacocks mouth or "River Karnadi"
મગપોન = પટવારી	Magpona = Village official who maintains land records
મક્મ = માનસરોવર	Makkam = Mansarovar (A time honoured lake of Tibet)
મયુર = બરફથી થીજી ગયેલા માનસરોવર પર પડેલી ફાટ	Mayur = A visible crack on the Layer of Ice formed on Mansarovar
તાલો = આ વર્ષ	Talo = This Year
દિરિંગ = આજ	Diring = Today
દુવંગ = દેવમંદિર	Duvang = Temple
નેર્પા = મંત્રી	Nerpa = Minister
પર = ફોટો	Per = Picture
પોંબો = અફસર	Pombo = Officer

મર = માખણ	Mer = Butter
મરકૂ = તેલ	Marak = Oil
મવંગ્ = માનસરોવર	Mavang = Mansarovar (A time honoured lake of Tibet)
યંબૂ = નેપાળ	Yambu = Nepal
યાક = તિબેટનો બળદ	Yak = A bull of Tibet
મે = અગ્નિ	May = Fire
મેન = ઔષધિ	Man = Medicine
રા = બકરી	Ra = Goat
યુંગ છોંગ = તિબેટનો સરકારી વેપારી	Young choung = Legal Business Man of Tibet
રિમ્પોછે, રિમ્પોછે = રત્ન, મણિ, પવિત્ર	Rinpoche, rimpoche = Gem, Ruby, Pure
રી = પહાડ	Re = Mountain
રે = સુતરાઉ કાપડ	Ray = Cotton Cloth
લંગકૂ છો = રાક્ષસતાલ	Lungak cho = Rakshas Tal
લંગચેન ખંબબ્ = હાથીના મુખમાંથી નીકળતી નદી, સતલજ નદી	Lungchan khambb = River which flows out from a Elephant's mouth or "River Satlej"
લમ = માર્ગ	Lum = Path
લપ્ચે = પત્થરોના ઢગલા	Lupche = A bunch of stones
લબૂ = મૂળા	Labu = Radish
લા = ઘાટા.	La = Loss
જી = મીણબત્તી	Gee = Candle
લામા = વિદ્વાન ભિક્ષુ	Lama = A literate Saint
લુક = ઘેટું	Look = Lamb
લુંગ = લુગબા, લુગવા, લુગમા = ઘાટી, ખીણ	Loong, Loongba, Loongva, Loongma = Valley
લ્હમ = તિબેટના ઉનમાંથી બનાવેલા જોડા	Lahm = A foot ware made of Tibet wool
લ્હરચી = કસ્તૂરી	Laherchi = Musk
લ્હા = દેવતા	Laha = God / Deity
શપજે = પાદચિહ્ન	Shapaje = Foot Print
શાક્ય થુબ્બા = બુદ્ધ ભગવાન	Shakya Thubba = Lord Buddha
શીંગ = વૃક્ષ અથવા લાકડી	Shingh = Tree or wooden Stick
શ્યા = માંસ	Shya = Flesh / Meat
શ્યો = દહીં	Shyoo = Yogurt /Curd
સંપો, સમ્પો = મોટી નદી, બ્રહ્મપુત્ર	Sampo = A Big River named Brahmaputra
મિ-દૂકૂ = ના	Meduk = No
મી = પુરુષ	Me = Man / Male
યુલ = ગામ	Yul = Village
લ્હખંગ = દેવમંદિર	Lahkhang = Temple
લ્હો = વર્ષ	Laho = Years
શોક = આવો	Shok = Come
સપટા = નકશો	Sapta = Map
સા = વાર	Sa = Day / Late
સિંગી ખંબબ્ = સિંહના મુખમાંથી નીકળતી નદી-સિંધુ નદી	Singhi khambb = River which flows out from a Lion's mouth or "River Sindhu"
સેર = સ્વર્ણ	Sear = Gold
સુદ = દર્દ	Sug = Pain
સેરૂછા = એકપ્રકારનો સોડા	Searucha = One type of soda

સંખ્યા			
૧	= ચિક	૧/૨	ફેકા અથવા છેકા
૨	= જી	૨/૧-૨	છેદંગ-સુમ
૩	= સુમ	૩/૧-૨	છેદંગ-શી
૪	= શી	૪/૧-૨	છેદંગ-ડા
૫	= ડા	મહિના	
૬	= ટુગ		
૭	= દુન	કાર્તિક	ચ્યૂવા
૮	= ગે	માર્ગશીર્ષ	ચ્યૂચિકવા
૯	= ગુ	પોષ	ચ્યૂડીવા
૧૦	= ચૂ	મહા	થંગવો
૨૦	= જીશુ	ફાગણ	ડીવા
૩૦	= સુમચૂ	ચૈત્ર	સુમવા
૪૦	= શિમચૂ	વૈશાખ	શીવા
૫૦	= મપચૂ	જેઠ	ડાવા
૬૦	= ટુગચૂ	અષાઢ	ટુગવા
૭૦	= દુનચુ	શ્રાવણ	દુનબા
૮૦	= ગેચૂ	ભાદરવો	ક્યેવા ૮૦
૯૦	= ગુપચૂ	આસો	ગૂવા
૧૦૦	= ગ્યાથંબા	દિવસો	
૨૦૦	= જીગ્યા		
૧૦૦૦	= તોંગ	રવિવાર	ન્યીમા
૧૦૦૦૦	= ઠી	સોમવાર	દાવા (ડાવા)
૧૦૦૦૦૦	= બુમ	મંગળવાર	મિંગમર
૧૦૦૦૦૦૦	= તંગ્યુર	બુધવાર	લ્હકપા
૧૦૦૦૦૦૦૦	= છીવા	ગુરુવાર	કુરબુ
		શુક્રવાર	પસંગ
		શનિવાર	પેન્પા
ગ્રહણ			
સૂર્યગ્રહણ		નિડજન	
ચંદ્રગ્રહણ		દમજન	

Numbers		
Chik	= 1	1/2
Gee	= 2	2/1-2
Soom	= 3	3/1-2
She	= 4	4/1-2
Da	= 5	
Tug	= 6	
Doon	= 7	
Gay	= 8	
Goo	= 9	
Chu	= 10	
Geesu	= 20	
Soomachu	= 30	
Shemachu	= 40	
Mapach	= 50	
Tugachu	= 60	
Doonachu	= 70	
Gaychu	= 80	
Goopachu	= 90	
Gyathamba	= 100	
Gigya	= 200	
Toung	= 1000	
Thee	= 10000	
Boom	= 100000	
Tangyur	= 1000000	
Chiwa	= 10000000	

	Month
Chuchikwa	= January
Chudiwa	= February
Thangwo	= March
Deva	= April
Soomwa	= May
Shiva	= June
Dava	= July
Toogwa	= August
Doonba	= September
Keywa	= October
Goowa	= November
Chuwa	= December
	Days
Nayeema	= Sunday
Daava	= Monday
Mingmer	= Tuesday
Lahakapa	= Wednesday
Kurbu	= Thursday
Pasang	= Friday
Penpa	= Saturday

Eclipse

Needjan	= Solar Eclipse
Damjan	= Lunar Eclipse

કૈલાસ માનસરોવર યાત્રાના વિભિન્ન માર્ગોમાં મુખ્ય ૧૪ જુદા જુદા માર્ગો છે. પરંતુ હાલમાં ઘારચુલાથી લિપુઘાટી લઈ તકલાકોટ થઈ માનસરોવર કૈલાસ જવાનો મુખ્ય માર્ગ છે. કૈલાસ માનસરોવરની યાત્રા દરમ્યાન તિબેટમાં વપરાતાં તિબેટી ભાષાનાં શબ્દનો ઉચ્ચાર અને અર્થ જાણવાથી ઘણી સરળતા રહે છે.

In the tour of "Kailash Mansarovar" there are 14 different routes to reach the Destination and preferred route is through - Dharachula to Lipughati and from there to Kailash Mansarovar via Taklacourt. By using Tibetan Language during this tour will ease the language problem to certain extent.

Zrebobhalee	बाहुबली	Bahubali
Munisuvratnath	भगवान मुनिसुव्रत	Bhagwan Munisuvrat Swami
Bing marvan	रावण	Ravan
Pema Tso	रावण सरोवर	Ravan Lake
Phang Pa LhaKang		Enlightened chapel
Tsepak Lhakang		Longevity chapel
Zamling Ryndrik		Sole ornament of world
Rim Poche	रत्नोनुं शीखर	Mountain of Gems
Kangri Kharchak	तिबेटन कैलास पुराण	Tibet Kailash Puran
Serdung Chuksum	१३ स्तुप कैलास की तलहटी में	13 Drigung-Kagyu Chorten
Netan Yalak Jung	नन्दी पर्वत	Nandi Parvat
Gang Kare Teashi	सफेद कैलास	White Kailash
Gyal Phal Pa Cherpura Gyalwapa	जैन	Jain
Goe Tsen	स्वेत मीट्टी	White Sand
Khyuchok	लोर्ड आदिनाथ ऋषभनाथ	Rushabhnath / Rushyanath
Sangye Shhukti, Eight Throne Yen Lak Geden, Na Gyad Den Ashtapad Temple	अष्टापद	Ashtapad
Phelwa	लोर्ड महावीर	Lord Mahavir
Phoo	राजा भरत	King Bharat
Gyagar	भारतीय	Indian

Ashtamangal

શંખ	शंख	Tangkel
નન્દ્યાવર્ત	नन्द्यावर्तः	Pata
છત્ર	छत्र	Dug
ધર્મચક્ર	धर्मचक्र	Khorlo
વિજયચક્ર	विजयचक्र	Gamchen
મીન યુગલ	मीन युगल	Sernya
કલશ	कलश	Bomba
પદ્મ	पद्म	Pema

Chapter - 08

Bon Po Religion

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Introduction

Bon is Tibet's oldest and spiritual tradition. In the area of western Tibet and around Himalayan border land, original indigenous religion was called Bon Po which is supposed to be more than 3000 years old and was contemporary with Jain religion at that time. Many of the principals of the Bon Po are similar to Jain principles. Bon Po had specialized *shraman* priests and Jain religion leaders were also called *shraman*.

Namkhai Norbu is a great Bon scholar and his article about Bon tradition in Ancient Tibet gives details about Drung, Deu & Bon- Narrations and Symbolic languages.

Article by Vajranatha on Bon tradition of Dzogchen practice throws light on teachings of Bon. Through the practice of Dzogchen, one can attain enlightment in this very life. Dzogchen is a Tibetan term that is made up of two words i.e.'Dzog' meaning complete and 'Chen' means great. In the west, Dzogchen means great perfection. Dzogchen practice prepares people to live with the moment without fear or distress like teachings of Jainism.

In the last article Dr. Dave did a comparative study of Bon and Jain religion and has presented his views in his article.

Pictures of Religious places visited in Tibet and Symbols used in Gompas and in daily life are given here.

Religious places visited in Tibet and Symbols used in Gompas in daily life

Hora Village Flag before arriving at Mansarovar

Gyangdrag Gompa

Upper Part of a Temple

Om Mani Padma Ho

Top of a Temple

Chakra and Deer

The Holy Cave of Serdung Chuksum (Sapta Rishi Gupha)

Inside The Serdung Chuksum (Sapta Rishi Gupha)

View of Phurdodla from Serdung Chuksum(Sapta Rishi Gupha)

Khamdo Sanglam La (2006)

Serdung Chuksum (Sapta Rishi Gupha) Chhortens

Mountain Steps & Flags

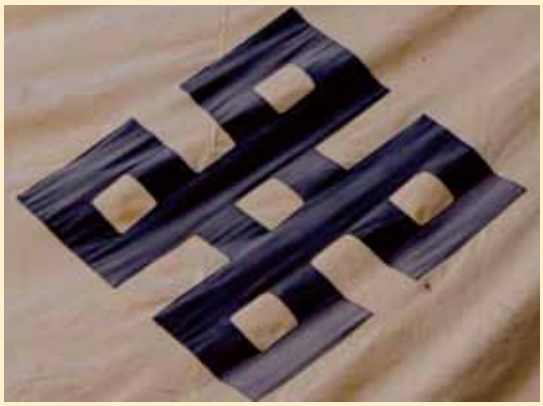
Serdung Chuksum (Sapta Rishi Gupha) Chhortens

Close-up of Serdung Chuksum

Vertical Ascent Up The Kailash Leading to Serdung Chuksum
(Sapta Rishi Gupha- Probable site of Rushabhdevji's Nirvan)

A Tablet inside the Serdung Chuksum (Sapta Rishi Gupha)

Deer



Nandhyavarta (Complex Swastika)

Horse

Half Dragon-Half Lion

Kalash (Vase)

Chakra (Wheel)

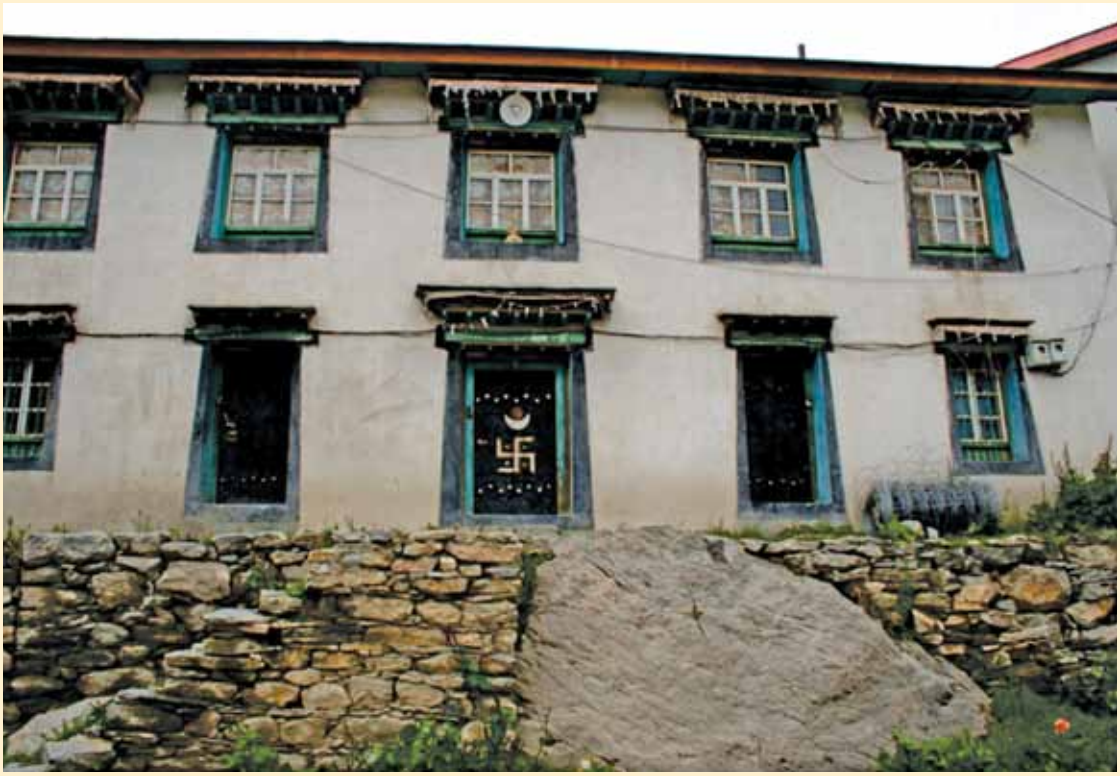
Swastik mark on a dwelling house

Moon with a circle

Hrim

Symbol of Lion on buckle of a belt

Tibetan Mani Stones carrying inscriptions written in Tibetan script



Swastik on a library building

33 Drung, Deu and Bon

Namkhai Norbu

Narrations, symbolic languages and the Bon tradition in ancient Tibet
Library of Tibetan Works and Archives

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Original Source - Drung, Deu & Bon; ISBN - 8185102937

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Guide to the Phonetic Transcription

We have adopted a somewhat simplified system of phonetic transcription for the Tibetan terms which enables the non specialist reader to pronounce, easily albeit not perfectly, the various Tibetan phonemes. As a general rule the consonants are pronounced like in English and the vowels like in Italian, with the following exceptions

The vowels ö and ü are pronounced like in German.

The consonant z is pronounced like in French or like the Italian voiced s;

zh is pronounced like the French j in jour;

ph and th are pronounced like the respective consonants but aspirated;

ng at the end of a word indicates nasalisation of n;

the gutturals g and k, labials b and p and dental d, after a vowel or at the end of a word are barely pronounced;

g before a vowel is always hard.

Most Tibetan words are of two syllables and the stress generally falls on the second syllable. For the notes and most of the terms in brackets, I have used the Wylie scientific transliteration system.

Foreword

It gives us great pleasure to publish this erudite and fascinating account of the origins of Tibetan culture by Professor Namkhai Norbu, one of the finest lama scholar of the century. Drung, Deu and Bon contains rare and valuable information on pre-Buddhist Tibetan culture, from the time of Tibet's first King, Nyatri Tsenpo, to the 28th King, Lhathothori Nyentsen. This is presented within the three categories commonly described as the foundation of the kingdom of Tibet, namely drung (narrations), deu (symbolic languages) and the Bon tradition.

Professor Norbu's fine intellect and compassionate mind are evident throughout the book. He investigates in turn the epic poems and legends of Tibet's secular culture, the mysteries of the ancient symbolic languages that conveyed wisdom inexpressible in conventional terms, or the complexities of the pre-Buddhist Bon religion in the context of its 12 'lores' or 'sciences'. In all three sections of the book, he seeks to uncover and preserve knowledge of the authentic roots of the present-day Tibetan culture.

The Library of Tibetan Works and Archives particularly welcomes scholarly works which shed light on the ancient wisdom of Tibet and reveal its influence upon the historical and cultural continuity of the Tibetan people today. Thus, we celebrate the emergence of this book and are confident that its contents will be of benefit to scholars and students of Tibetan culture around the world.

We are grateful to Don Eisenberg who devoted much time to the computer formating of the book. We trust that this great work will continue to be esteemed far into the future.

Gyatsho Tshering
Director
Library of Tibetan Works & Archives
March, 1995

Preface

The author of this book, Professor Namkhai Norbu, is one of the most original and singular personalities in the field of contemporary Tibetan culture. As well as being well known in the west as one of the most authoritative masters of Dzogchen (*rDzogs chen*), an ancient teaching that embodies the essence of Tibetan spirituality, he is also deeply and widely versed in all the religious, medical and astrological traditions of his country, to which he has devoted studies, and on which he has written numerous works.[1] Particularly, over many years he has undertaken research into the origins of Tibetan culture, identifying in the ancient kingdom of Shang Shung (*Zhang Zhung*), which had its centre in western Tibet, and in the Bon religion the roots of the marvellous flowering of wisdom and spirituality that took place on 'The roof of the world'.

In this book, written in 1982, he gives a global overview of pre-Buddhist Tibetan culture, taking his cue from the statement, repeated in several historical texts, that rule of the ancient Tibetan kingdom was based on three factors: *drung* (*sgrung*: narrations); *deu* (*Ide'u*: symbolic languages); and Bon (*bon*). On the basis of several quotations drawn from historical sources and ritual texts the author unfolds with great clarity the functions and characteristic traits of the ancient Tibetan wisdom, delving particularly into each of the diverse cognitive and magic ritual traditions belonging to the twelve 'lores' or 'sciences' (*$hes pa bcu gnyis*) of Bon, utilising an original and deep interpretative method which could also be applied to the study of the other religious traditions of the past.

The first chapter of the book is devoted to the *drung*, which comprised every kind of narrative, from epic poems to legends, from fables to anecdotes, and which undoubtedly formed the 'secular' culture of the country. Just as in other ancient civilisations, the cultural heritage of the people actually lay in the hands of the bards (*sgrung mkhari*) who in their epics and poems, as well as the ancestry of the royal and noble families and the narrations of important historical events, handed down all the heritage of traditional knowledge and cosmogonic notions of the country. Thus it represented the main means of diffusion of culture and of education. Moreover, many of these tales were, as the author explains, derived from the 'origin myths' which guaranteed the efficacy and correct functioning of the Bon rites and of which we will read numerous examples in the course of the book.

The *deu*, treated in the second chapter of the book, consisted in symbolic or cryptic languages used to communicate information and secret messages through the use of words and with the aid of objects charged with special imports. Thus they were instruments for the discovery of wisdom which could not be communicated openly, 'keys' to open the door of knowledge of the ineffable and the unknown, as we can deduce from their use in the Dzogchen teaching and by the association of the probable original meaning of the term *deu* with certain divinatory practices. However the field of the *deu* was not limited to spiritual initiations or divination, they were also widely used as a kind of cipher code by members of the court for strategical and political ends and by the common people to resolve particular problems and needs. It is likely that with the passing of time only the outer and more superficial aspect of this ancient form of knowledge remained, that of the enigma or riddle, because this is the meaning of the term which has survived in modern Tibetan.

The major part of the book is devoted to Bon. It is divided in thirteen chapters, one introductory and twelve treating of the 'twelve lores' of Bon. It appears that originally Bon consisted in an assortment of magicorituae cognitions and practices based on the principle of the interaction of man and the outer forces of nature and of the cosmos, 'invisible' to ordinary perception but highly influential and determinant in human existence. The ancient Bon Po's, as transpires from the extant ritual literature and from the pages of this book, had deep knowledge of the energy dimension of the individual and of the energies present in the universe, personified or dominated by a great variety of powerful non human beings capable of benefitting but also of disturbing man. According to tradition at a certain moment in time these ritual cognitions and practices, some of which included animal. sacrifices, were revised and codified by Shenrab Miwoche (*gShen rab mi bo che*), a master from Shang Shung who was in many ways similar to the great sages and founders of religions of the past. His teachings were then classified in different ways; that of the 'twelve lores' appears to be the most ancient classification, as we shall have occasion to see.

Only in recent years in the Tibetological field has Bon become the object of serious study and research, so that there still persist several doubts and uncertainties concerning its origin and the history of its evolution, also on account of the scarcity of ancient sources and archaeological findings. Current Bon religion, codified into a canon of scriptures very similar to the Buddhist one, does not differ in its philosophical principles and ritual and meditative practices from the other Tibetan schools of the Buddhist tradition. The separation of the 'more 'authentic' or ancient traditions from those influenced by Buddhism has been one of the major tasks of those who in recent years have devoted themselves to the study of Bon; however the results have not always been satisfactory or in accord. For this reason at times there has been a tendency to dismiss the idea that Bon might have been the autochthonous religion of tibet and to hypothesize that it was instead the outcome of a religious syncretism of Indian, Buddhist, Iranian and other elements which took place in the west and northwest of the country in an era preceding the official introduction of Buddhism in Tibet in the seventh and eighth centuries. As a result of this tendency in the field of Tibetology it is considered that the study of the pre-Buddhist religion of Tibet should be distinguished from the study of the Bon religion and based mainly, if not exclusively, on the Tun Huang manuscripts not withstanding the fact that these manuscripts, generally recognised as reliable sources for the study of Tibetan history and religion, contain numerous descriptions of rites performed by officiants called *Bon Po* and *shenpo*. Moreover, large part of the cognitive and magico-ritual traditions found among the 'twelve lores' of Bon are generally subsumed under the name 'folk religion', an expression which although it transmits the sense of 'autochthonous' and 'traditional' nevertheless does not help clarify their origin or historical collocation.

The importance of Professor Namkhai Norbu's study and research lies, in my view, in its capacity to explain the various cultural and religious phenomena of ancient Tibet in the light of a clear and consistent key of interpretation: the conception of man as the indivisible centre of inner energies symbolised by deities on one side and as the 'support' of outer energies dominated by different classes of beings on the other. On the basis of this knowledge the various phenomena of existence were interpreted as modalities of the interaction between these two types of energy.

In ancient times the Tibetans believed that by intervening in nature and altering the original harmony man could disturb the energies or 'deities' tied to various environments and that the ensuing disharmony could provoke a decline in his health and prosperity. The Bon Po's were specialists in identifying the causes of the disturbances, through divination, astrology etc. and in prescribing suitable remedies which in most cases consisted in rites, according to this tradition the main means of restoring cosmic and individual harmony. Understanding in our own time the value and significance of these rites means opening a door onto the immense panorama of the primordial experiences and knowledge of man because, as the great scholar Mircea Eliade suggested at the conclusion of his study of Australian religions "The ultimate goal of the historian of religions is not to point out that there exist a certain number of types or patterns of religious behaviour, with their specific symbologies and theologies, but rather to *understand their meanings.*"

In our era we have witnessed the disappearance of values and traditions based on civilizations thousands of years old, and nowadays man seems to have forgotten that part of himself which formed the essential nucleus of the myths and rites of ancient peoples. For this reason the danger of extinction of a culture tied to ancient traditions, as the Tibetan tradition is, means the loss of a knowledge that belongs to all of humanity, as it is part of that original wisdom or global vision that we find in various forms in all the religious cultures of the world.

In my translation of the original Tibetan and in my edition and annotation I have enjoyed the generous collaboration of the author, who was my Professor of Tibetan at the Istituto Universitario Orientale in the University of Naples, where he currently holds the chair in Tibetan and Mongolian Studies. With unsparing patience he went over the whole translation and helped me resolve several doubts and difficulties, particularly in the interpretation of passages from ancient ritual texts which frequently contained terms and expressions that have disappeared from modern Tibetan and are not to be found in the Tibetan dictionaries currently available. Heartfelt thanks are also due to Lobpon (*slob dpon*) Tenzin Namdak (*bsTan 'dzin rnam dag*), a leading exponent of Bon from Menri (*sMan ri*) Monastery in central Tibet, who during his stay in Italy in August 1989 clarified aspects and characteristics of the ancient ritual traditions for me. Finally I wish to thank Geshe (*dge bshes*) Tenzin Wangyal (*bsTan 'dzin dbang rgyal*), a young Bon Po scholar currently living in the west, who helped me resolve certain doubts in the translation.

Adriano Clemente.
May 1991

34 The Bon Po Traditions of Dzogchen

Vajranatha

The Bon Po and Nyingmapa Traditions of Dzogchen

In general, the Dzogchen teachings are found only in the old unreformed Tibetan schools of the Buddhist Nyingmapas and the non-Buddhist Bon Po's. In both cases, these teachings are substantially the same in meaning and tenninology, and both traditions claim to have an unbroken lineage coming down to the present time from the eighth century and even before. Both of these schools assert that Dzogchen did not originate in Tibet itself, but had a Central Asian origin and was subsequently brought to Central Tibet by certain masters known as Mahasiddhas or great adepts. There thus would appear to exist two ancient and authentic lineages for the Dzogchen teachings, the Buddhist and the Bon Po. As I have previously discussed the Nyingmapa Buddhist tradition of the origin of Dzogchen in my book. The Golden Letters, here I shall present a preliminary survey of the Bon Po tradition of Dzogchen known as the Zhang-Zhung Nyan-gyud. This Bon Po tradition is especially important for research into the historical origins of Dzogchen because it claims to represent a continuous oral tradition (snyan-rgyud) from the earliest times coming from Zhang-Zhung in Western Tibet. [1]

Although some medieval and modem Tibetan histories written by cloistered Buddhist monks portray the ancient pre-Buddhist religion of Tibet called Bon as a nefarious mixture of sorcery, black magic, shamanism, and bloody sacrifices, this appears to be just so much anti-Bon Po propaganda providing a melodramatic effect. The principal aim of these Buddhist historians was to glorify the role of Indian Mahayana Buddhism in Tibetan history, suggesting that there was no culture nor civilization in Tibet before the coming of Indian Buddhism to Central Tibet in the seventh century of our era. India, the birthplace of the Lord Shakyamuni Buddha, was looked upon, not only as the source of all genuine religion and spirituality, but as the source of civilized culture generally, and even the lineage of Tibetan kings was traced back to an Indian origin by such native Tibetan historians as Go Lotsawa, Buton, and others. [2]

Another problem is that the Tibetan term bon, probably deriving from the old verb fonn 'bond-pa, meaning "to invoke the gods," [3] has two different cultural referants. In the first usage, Bon does indeed refer to the indigenous pre-Buddhist shamanistic and animistic culture of Tibet, a culture that possessed many characteristics in common with other shamanistic tribal cultures of

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Central Asia and Siberia. Although these cultures involved various types of religious practice and belief, the central role was occupied by a practitioner known as a shaman. The activity of the shaman was definitively characterized as entering into a altered state of consciousness by way of chanting, drumming, dancing, and so on, whether this altered state of consciousness or "ecstasy" was understood to be soul-travel, as an out-of-the-body experience, or a form of spirit possession. [4] The principal social function of such a practitioner was healing. A traditional form of Central Asian shamanism involving spirit possession continues to be practiced widely in Tibet even today among both Buddhist and Bon Po populations, as well as among Tibetan refugees living elsewhere in Ladakh, Nepal, and Bhutan. Such a practitioner is known as a lha-pa or dpa'-bo. [5] Elsewhere on the borders of Tibet in the Himalayas and along the Sino-Tibetan frontiers, among certain Tibetan speaking and related peoples, there exist shamanic practitioners known as Bon Po's, as for example among the Na-khi in China [6] and among the Tamangs in Nepal. [7]

But there exists a second type of religious culture also known as "Bon" whose adherents claim to represent the pre-Buddhist civilization of Tibet. These practitioners of Bon assert that at least part of their religious tradition was not native to Tibet, but was brought to Central Tibet sometime before the seventh century from the previously independent country of Zhang-Zhung, west of Tibet, and more remotely from Tazik (stag-gzig) or Iranian speaking Central Asia to the northwest. [8] This from of Bon is known also as Yungdrung Bon (g.yung-drung bon), "the Eternal Teaching," a term which could be reconstructed into Sanskrit as "Svastika-dharma," where the swastika or sun-cross is the symbol of the eternal and the indestructable, corresponding in most every respect to the Buddhist term vajra or diamond (rdo-rje). In addition to ritual texts relating to shamanic and animistic practices, this ancient tradition possesses a large corpus of texts, also claiming to be pre-Buddhist in origin, relating to the higher teachings of Sutra, Tantra, and Dzogchen (mdo rgyud manngag gsum). The Bon Po Lamas, instead of looking back to the North Indian prince, Siddhartha Gautama, as their Buddha and as the source of their higher teachings of Sutra, Tantra, and Dzogchen, look back even further in time to another prince, Shenrab Miwoche (gShen-rab mi-bo-che), born in Olmo Lungring ('Ol-mo lung-ring) in remote Central Asia, as their Buddha (sangs-rgyas) and as the source of their teachings. Hence, the latter is given the title of Tonpa or Teacher (ston-pa), literally "the one who reveals". Modern scholars may question the historicity of this figure and Tonpa Shenrab is indeed given a rather fabulous date by the Bon Po tradition, asserting that he flourished some eighteen thousand years ago. [9] Futhermore, he is given a hagiography in Bon Po sources in no way inferior to that of Shakyamuni Buddha, as found, for example, in the Lalitavistara. [10] Along with the fabulous hagiographies of Padmasambhava found in the extensive literature of the Nyingmapa school, such as the Padma bka'-thang and the bKa'-thang gser-phreng, the career of Tonpa Shenrab represents one of the great epic cycles of Tibetan literature. [11]

To the outsider this Yungdrung Bon nowadays appears little different from the other schools of Tibetan Buddhism in terms of their higher doctrines and monastic practices. Contemporary Bon Possesses a monastic system much like the Buddhist one and a Madhyamaka philosophy fully comparable with the other Tibetan Buddhist schools. According to the Bon Po Lamas themselves, the main difference between Bon and the Buddhist schools is one of lineage rather than of teaching or doctrine, since the Bon Po's look to Tonpa Shenrab as their founder and the

Buddhists look to Shakyamuni. Indeed, both of these numinous figures are manifestations of Buddha enlightenment in our world, an epiphany that is technically known as a Nirmanakaya (sprul-sku). H.H. the Dalai Lama has now recognized Bon as the fifth Tibetan religious school, along side the Nyingmapas, the Sakyapas, the Kagyudpas, and the Gelugpas, and has given the Bon Po's representation on the Council of Religious Affairs at Dharamsala. [12]

The Historical Development of Bon

Some Tibetan historians and scholars, on tne other hand, were aware of this distinction between the two kinds of Bon referred to above [13], and certainly the Bon Po Lamas themselves were aware of it. According to one leading native-born Bon Po scholar, Lopon Tenzin Namdak [14], the history of the development of Bon may be divided into three phases:

1. Primitive Bon was the indiginous shamanism and animism of Tibet and adjacent regions in ancient times. Indeed, according to Bon Po tradition, some of these practices such as invoking the gods (lha gsol-ba) and rites for exorcising evil spirits (sel-ba) were actually taught by Tonpa Shenrab himself when he briefly visited Kongpo in Southeastern Tibet in prehistoric times. [15] Such rites were later incorporated into the classification of the teachings and practices of Bon known as the nine successive ways or vehicles (theg-pa rim (dgu). These shamanistic types of practices are now known as "the Causal Ways of Bon" (rgyu'i theg-pa). Teaching and practice found in the Causal Ways are considered to be dualistic in their philosophical view, that is, the gods (lha) representing the forces oflight and order called Ye and the demons (bdud) representing the forces of darkness and chaos called Ngam have an independent existence, and the concern of the practitioner is principally with the performing of rituals that invoke the positive energies of the gods and repel the negative influences of the demons and evil spirits (gdon). [16] An examination of the ritual texts in question reveals them to be largely of non-Indian origin. [17] However, like Buddhism generally, Yungdrung Bon is totally opposed to the practice of blood sacrifice (dmar mchod), for the origin of such practices are attributed to the cannibalistic Sinpo (srin-po) demons and not to Tonpa Shenrab. Thus, Bon Po Lamas are loath to identify even the Causal Ways of Bon with the slianianism of the Jhangkris of shamans still flourishing in the mountains of Nepal who continue even today to perform blood sacrifices. [18]
2. Old Bon (bon rnying-ma), or Yundrung Bon (g.yung-drung bon) as such, consists of the teachings and the practices attributed to Shenrab Miwoche himself in his role as the Teacher or the source of revelation (ston-pa), and, in particular, this means the higher teachings of Sutra, Tantra, and Dzogchen. He revealed these teachings to his disciples in Olmo Lungring on earth and elsewhere in a celestial realm in his previous incarnation as Chimed Tsugphud ('Chi-med gtsug-phud). [19] These teachings of Tonpa Shenrab, already set down in writing in his own time or in the subsequent period, are said to have been brought at a later time from Olmo Lungring in Tazik to the country of Zhang-Zhung in Western and Northern Tibet where they were translated into the Zhang-Zhung language. Zhang-Zhung appears to have been an actual language, distinct from Tibetan, and appearantly related to the West Himalayan Tibeto-Burman dialect of

Kinauri. Thus, it was not some artificial creation fabricated by the Bon Po's in order to have an ancient source language corresponding to the Indian Sanskrit of the Buddhist scriptures. [20]

Beginning with the reign of the second king of Tibet, Mutri Tsanpo, it is said that certain Bon Po texts, in particular the Father Tantras (pha rgyud), were brought from Zhang-Zhung to Central Tibet and translated into the Tibetan language. [21] Thus the Bon Po's assert that Tibetan acquired a system of writing at this time, based on the sMar-yig script used in Zhang-Zhung which would, therefore, have been ancestral to the dbus-med script now often used for composing Tibetan manuscripts, especially among the Bon Po's. [22] The Bon Po's subsequently experienced two persecutions in Central Tibet, the first under the eighth king of Tibet, Drigum Tsanpo, and later the second under the great Buddhist king of Tibet, Trisong Detsan in the eighth century of our era. According to the tradition, on both occasions, the persecuted Bon Po sages concealed their books in various places in Tibet and adjacent regions such as Bhutan. These caches of texts were rediscovered beginning in the tenth century. Thus they are known as rediscovered texts or as "hidden treasures" (gter-ma). [23] Certain other texts were never concealed, but remained in circulation and were passed down from the time of the eighth century in a continuous lineage. These are known as snyan-rgyud, literally "oral transmission", even though they are usually said to have existed as written texts even from the early period. One example of such an "oral tradition" is the Zhang-Zhung snyan-rgyud, which, in the eighth century, the master Tapihritsa gave permission to his disciple Gyerpungpa to write down in the form of his pithy secret oral instructions (man-ngag, Skt. upadesha). Or else, the texts were dictated during the course of ecstatic visions or altered states of consciousness by certain ancient sages or certain deities to Lamas who lived in later centuries. One such example of this was the famous lengthy hagiography of Tonpa Shenrab known as the gZi-brjid, dictated to Lodan Nyingpo (bLoldan snying-po, b.1360) by certain mountain spirits. This classification is rather similar to the Nyingmapa classification of its scriptures into bka'-ma and gter-ma. [24] This form of Old Bon flourished in Western and Central Tibet down to our own day.

The teachings of Bon revealed by Tonpa Shenrab are classified differently in the three traditional hagiographical accounts of his life. In general, Tonpa Shenrab was said to have expounded Bon in three cycles of teachings:

I. The Nine Successive Vehicles to Enlightenment (theg-pa rim dgu);

II. The Four Portals of Bon and the fifth which is the Treasury (sgo bzhi mdzod Inga); and

III. The Three Cycles of Precepts that are Outer, Inner, and Secret (bka' phyi nang gsang skor gsum).

These Nine Ways or Nine Successive Vehicles to Enlightenment are delineated according to three different systems of hidden treasure texts (gter-ma) that were put into concealment during the earlier persecutions of Bon and were rediscovered in later centuries. These treasure systems are designated according to the locations where the hidden treasure texts were discovered.

1. The System of the Southern Treasures (lho gter lugs): These were the treasure texts rediscovered at Drigtsam Thakar ('brig-mtsham mtha' dkar) in Southern Tibet and at Paro (spa-gro) in Bhutan. Here the Nine Ways are first divided in to the Four Causal Ways, which contain many myths and magical shamanistic rituals, and which are principally concerned with working with energies for worldly benefits. Then there are the five higher spiritual ways known as the Fruitional Ways. Here the purpose is not gaining power or insuring health and prosperity in the present world, but realization of the ultimate spiritual goal of liberation from the suffering experienced in the cycles of rebirth within Samsara. The final and ultimate vehicle found here in this nine-fold classification is that of Dzogchen. [25]
2. The System of the Central Treasures (dbus gter lugs): These treasure texts were rediscovered at various sites in Central Tibet, including the great Buddhist monastery of Samye. In general, this classification of the Bon Po teachings is rather similar to the system of the Nine Vehicles found in the traditions of the Nyingmapa school of Tibetan Buddhism. Some of these Bon Po texts are said to have been introduced from India into Tibet by the great native-born Tibetan translator Vairochana of Pagor, who translated works from both the Buddhist and the Bon Po traditions. [26]
3. The System of the Northern Treasures (byang gter lugs): These treasure texts were rediscovered at various locations north of Central Tibet. However, according to Lopon Tenzin Namdak, not much is currently known regarding this system. [27]

The Four Portals of Bon and the Treasury which is the fifth (bon sgo bzhi mdzod Inga) represent another and probably independent system for the classification of the Bon Po teachings into four groups known as the Four Portals (sgo bzhi), together with an appendix known as the Treasury (mdzod). These groups or classes of teachings are as follows:

1. The Bon of "The White Waters" containing the Fierce Mantras (chab dkar drag-po sngags kyi bon): This collection consists of esoteric Tantric practices focusing the recitation wrathful or fierce mantras (drag sngags) associated with various meditation deities. Within this class are included the Chyipung cycle or "General Collection" (spyi-spungs skor), that is to say, the practices associated with the Father Tantras (pha rgyud). [28]
2. The Bon of "The Black Waters" for the continuity of existence (chab nag srid-pa rgyud kyi bon): This collection consists of various magical rituals, funeral rites, ransom rites, divination practices, and so on, necessary for the process of purifying and counteracting negative energies. This collection would seem to correspond, by and large, to the Four Causal Ways described above. Here the term "black" refers not to the practitioner's intention, but to the expelling of negativities, which are black in color symbolically.
3. The Bon of the Extensive Prajnaparamita from the country of Phanyul ('phan-yul rgyas-pa 'bum gyi bon): This collection consists of the moral precepts, vows, rules, and ethical teachings for both monks and ordained lay people. In particular, the focus is on the philosophical and ethical system of the Prajnaparamita Sutras which are preserved in the Bon Po version in sixteen volumes known as the Khams-chen. This collection basically represents the Sutra system, whereas the Chab dkar represents the Tantra system. [29]

4. The Bon of the Scriptures and the Secret Oral Instructions of the Masters (dpon-gsas manngag lung gi bon): This collection consists of the oral instructions (man-ngag) and the written scriptures (lung) of the various masters (dpon-gsas) belonging to the lineages of transmission for Dzogchen.

5. The Bon of the Treasury which is of the highest purity and is all-inclusive (gtsang mtho-thog spyi-rgyug mdzod kyi bon): This collection contains essential material from all Four Portals of Bon. The Treasury which is the fifth (mdzod lnga) is decribed in the gZer-myig, "As for the highest purity (gtsang mtho-thog), it extends everywhere. As insight, it belongs to the Bon that is universal (spyi-gcod). It purifies the stream of consciousness in terms of all four Portals." [30]

The Three Cycles of Precepts that are Outer, Inner, and Secret (bka' phyi nang gsang skor gsum) are as follows:

1. The Outer Cycle (phyi skor) contains the Sutra system of teachings (mdo-Iugs) relating to the Path of Renunciation (spong lam).

2. The Inner Cycle (nang skor) contains the Tantra system of teachings (rgyud-Iugs) relating to the Path of Transformation (sgyur lam), otherwise known as the Secret Mantras (gsang sngags).

3. The Secret Cycle (gsang skor) contains the Upadesha teachings (man-ngag) relating to the Path of Self-Liberation (grollam), otherwise known as Dzogchen, the Great Perfection.

4. New Bon (bon gsar-ma) arose since the fourteenth century, relying upon the discoveries of a different Terma system than the above. As a whole, this system is quite similar to the Nyingmapa one and here Padmasambhava is also regarded as an important figure. Indeed, some Tertons, such as Dorje Lingpa, discovered both Nyingmapa and Bon Po Termas. In a text such as the Bon-khrid, rediscovered by Tsewang Gyalpo, it is asserted that Padmasambhava went to Uddiyana and received the Dzogchen teachings directly from the Sambhogakaya Shenlha Odkar (gShen-lha 'od-dkar) himself. Later he transmitted these teachings in Tibet, concealing many of them as Terms meant for the use of the future generations of Bon Po's. According to Shardza Rinpoche also, the New Bon Movement began in the fourteenth century and continues until today. The Termas revealed to such masters as Lodan Nyingpo, Mizhik Dorje (otherwise known as Dorje Lingpa), Kundrol Dragpa, Dechen Lingpa, Sang-ngag Lingpa, Khandro Dechen Wangmo, and so on, are all considered Tersar (gter-gsar) or recent treasure text discoveries. The New Bon has flourished mainly in Eastern Tibet. [31]

The Origin of Dzogchen

Just as in the case of the Nyingmapas among the Tibetan Buddhists, the Bon Po tradition possesses as its highest teaching the system of contemplation known as Dzogchen, "the Great Perfection," (rdogs-pa chen-po). These teachings reveal in one's immediate experience the Primordial State (ye gzhi) of the individual, that is to say, the individual's inherent Buddha-nature or Bodhichitta, which is beyond all time and conditioning and conceptual limitations. This Natural State (gnas-Iugs) is spoken of in terms of its intrinsic primordial purity (ka-dag) and its spontaneous

perfection in manifestation (Ihun-grub). Both the Buddhist Nyingmapas and the Bon Po's assert that their respective Dzogchen traditions were brought to Central Tibet in the eighth century, the Nyingmapa transmission from the Mahasiddha Shrisimha in living in Northern India and the Bon Po transmission from a line of Mahasiddhas dwelling around Mount Kailash and the lake country of Zhang-Zhung to the west and north of Tibet. Thus there appear to exist two different historically authentic lineages for the transmission of these teachings.

Subsequently, the Nyingmapa transmission of the Dzogchen precepts was brought to Central Tibet principally due to the activities of three teachers: the great Tantric master Padmasambhava from the country of Uddiyana, the Mahasiddha and Mahapandita Vimalamitra from India, and the native-born Tibetan translator Vairochana of Pagor. According to tradition, the latter came originally from a Bon Po family. [32] It is said that he and Vimalamitra were responsible for the first translations of the texts belonging to the Semde (sems-sde) or "Mind Series" and the Longde (klong-sde) or "Space Series" of Dzogchen teachings. However, some scholars, both Tibetan and Western, dispute that Vairochana actually made the many translations attributed to him. [33] Moreover, some contemporary scholars assert that the Dzogchen Tantras, which represent the literary sources for the Dzogchen teachings, were actually fabricated in the tenth century by certain unnamed unscrupulous Bon Po and Nyingmapa Lamas who then anachronistically attributed them to earlier numinous figures like Padmasambhava and Tapihritsa in order to win their acceptance as authentic scriptures. They therefore represent a kind of Buddhist and Bon Po Apocrypha and Pseudepigrapha. Modern critics cite the fact that, with the exception of two short Dzogchen texts, the Rig-pa'i khu-byug and the sBas-pa'i sgum-chung, the texts of the Dzogchen Tantras have not been found in the Tun Huang library on the borders of Western China, which was sealed in the tenth century. But simply noting that these texts were not discovered at Tun Huang does not prove that they did not exist elsewhere at the time or that they must have been composed after the closing of that library. On the basis of the extant evidence and in view of the lack of a thorough analysis of all the texts in question, it would appear that this conclusion unwarranted. [34]

It has also been asserted by some scholars that Padmasambhava, although he may have been an actual historical figure, certainly did not teach Dzogchen, but only the Tantric system of the sGrub-pa bka' brgyad, the practices of the eight Herukas or wrathful meditation deities. This system forms the Sadhana Section (sgrub-sde) of Mahayoga Tantra. [35] However, eminent Nyingmapa Lama-scholars, such as the late Dudjom Rinpoche, reply that although Padmasambhava may not have taught Dzogchen as an independent vehicle to enlightenment, he did indeed teach it as an Upadesha (man-ngag), or secret oral instruction, to his immediate circle of Tibetan disciples. This private instruction concerned the practice of Dzogchen and the interpretation of the experiences arising from this practice of contemplation. In the context of the system of Mahayoga Tantra, Dzogchen is the name for the culminating phase of the Tantric process of transformation, transcending both the Generation Process (bskyed-rim) and the Perfection Process (rdzogs-rim). In this context, Dzogchen would correspond in some ways to the practice of Mahamudra in the New Tantra system (rgyud gsar-ma) of the other Tibetan schools. An old text, the Man-ngag Ita-ba'i phreng-ba, traditionally attributed to Padmasambhava himself, does not treat Dzogchen as an independent vehicle (theg-pa, Skt. yana), but only as part of the

system of the Higher Tantras. [36] When taught as an independent vehicle, Dzogchen practice does not require any antecedent process of Tantric transformation of the practitioner into a deity, and so on, before entering into the state of even contemplation (mnyam-bzhag). [37] So it would appear that, according to the Nyingmapa tradition at least, Dzogchen originated as an Upadesha that elucidated a state of contemplation or intrinsic Awareness (rig-pa) that transcedended the Tantric process of transformation alone, both in terms of generation and of perfection. Therefore, it became known as the "great perfection," that is to say, the state of total perfection and completion where nothing is lacking.

According to Nyingmapa tradition, the Dzogchen precepts were first expounded in our human world by the Nirmanakaya Garab Dorje (dGa'-rab rdo-rje, Skt. *Prahevajra) in the country of Uddiyana and were later propagated in India by his disciple Manjushrimitra. The latter transmitted them to his diciple Shrisimha who, in turn, conferred them upon Padmasambhava, Vimalamitra, and Vairochana the translator. These three brought the precepts to Tibet in the middle part of the eighth century. Thus, this teaching was originally a secret oral instruction restricted to a small group of Tantric initiates. The tradition claims that it originally came from the mysterious country of Uddiyana to the northwest of India. Therefore, it appears most likely that it is to the Indo-Tibetan borderlands of the northwest that we should look for the origins of Dzogchen. [38]

This seems equally true for the historical origins of Bon Po Dzogchen, for this second authentic lineage of the Dzogchen teachings also did not originate in India proper, but was brought to Central Tibet in the ninth and tenth centuries from Zhang-Zhung in Northern Tibet by the disciples decending from Gyerpung Nangzher Lodpo. [39] Until the eighth century, the country of Zhang-Zhung had been an independent kingdom with its own language and culture. It lay in what is now Western and Northern Tibet and the center of the country was dominated by the majestic presence of the sacred mountain of Gangchen Tise or Mount Kailash. Examining the available evidence, it now appears likely that before Indian Buddhism came to Central Tibet in the seventh and eighth centuries, Zhang-Zhung had extensive contacts with the Buddhist cultures that flourished around it in Central Asia and in the Indo-Tibetan borderlands. Just to the west of Zhang-Zhung there once existed the vast Kushana empire which was Buddhist in its religious culture. It was an area in which Indian Buddhism interacted with various strands of Iranian religion - Zoroastrian, Zurvanist, Mithraist, Manichean, as well as Indian Shaivism and Nestorian Christianity. This was also true of the oasis cities of the Silk Route to the northeast of Zhang-Zhung such as Kashgar. Some scholars have seen this region beyond India as playing a key role in the development of certain aspects of Mahayana Buddhism, and later also in the development of Tantric form of Buddhism known as Vajrayana. [40] For example, the revelation of the Guhyasamaja Tantra is said to have occurred to king Indrabhuti in Uddiyana and was later brought to India proper by the Mahasiddhas Saraha and Nagarjuna. [41] Moreover, the Kalachakra Tantra is said to have been brought from Shambhala in Central Asia to Nalanda in India in the tenth century by the Mahasiddha Tsilupa. [42] The Bon Po's came to identify this Shambhala with Olmo Lungring itself. [43] All this suggests that certain trends within Yungdrung Bon, rather than being later plagiarisms and imitations of Indian Buddhism concocted in the tenth century, actually do go back to a kind of syncretistic Indo-Iranian Buddhism that once flourished in the

independent kingdom of Zhang-Zhung before it was forcibly incorporated into the expanding Tibetan empire in the eighth century. This "Buddhism", known as gyer in the Zhang-Zhung language and as bon in the Tibetan, was not particularly monastic, but more Tantric in nature and its diffusion was stimulated by the presence of various Mahasiddhas in the region such as the illustrious Tapihritsa and his predecessors dwelling in caves about Mount Kailash and about the lakes to the east in Northern Tibet. Even into this century, Kailash remained an important site of pilgrimage drawing Hindu sadhus and yogis from India. [44]

Such a mixed "Buddhist" culture, being both Tantric and shamanic, was suppressed in the eighth century when, at the instigation of the Tibetan king Trisong Detsan, the last king of independent Zhang-Zhung, Ligmigya, was ambushed and assassinated when he left his castle of Khyung-dzong on the Dang-ra lake in Northern Tibet. Zhang-Zhung and its people were absorbed into the Tibetan empire and disappeared as an independent entity. The ZhangZhung-pas were pressed into the service of the Tibetan army as it expanded westward into Ladakh and Baltistan. [45] Today the Zhang-Zhung-pas survive as the nomad people of Western and Northern Tibet, often possessing the same ancient clan names. But having been converted to the Drigung Kagyudpa school of Buddhism, they have forgotten their ancient heritage. The old caves, once the dwelling places of the Bon Po Mahasiddhas, are now thought to be the domain of ghosts, places to be shunned and avoided. Yet ancient ruins, believed to antedate the Tibetan empire, are still to be seen at Khyung-Iung (Khyung-Iung dngul-mkhar) west of Kailash and on the shores of the Dang-ra lake to the east in Northern Tibet. [46]

In response to the urgings of the Indian Buddhist monk-scholar Bodhisattva, who thoroughly rejected these Bon Po heretics, [47] and failing to recognize the ties of doctrine and practice between the "Buddhism" of Zhang-Zhung known as Gyer or Bon, with the monastic Buddhism recently imported from India into Central Tibet, the Tibetan government actively suppressed the indiginous religious culture of Zhang-Zhung. Moreover, the persecution of the Bon Po's by the Tibetan king Trisong Detsan may have had a political motive and not just a religious one. At that time, the Bon Po's in Tibet were certainly not organized into a rival church or sect that could effectively oppose the Indian monks financially supported by the Tibetan government. This picture was a later anachronism created in the accounts of the medieval Buddhist historians. Rather than a conflict of rival religious doctrines, a parallel might be the suppression and subsequent annihilation of the Druids by the Romans in Gaul and Britain, where the Druids represented an ever-present source for Celtic nationalism and rallying point for resistance against Roman rule. In the same way, the Bon Po's may also have been suppressed because they represented a possible source of Zhang-Zhung-pa rebellion against the rule of the Yarlung dynasty of Tibet. Just as the Druids were accused of making human sacrifices and the Romans used this accusation as an excuse to exterminate them, so the Bon Po's were accused of making blood sacrifices and this represented another excuse for expelling them from Tibet.

The Three Traditions of Bon Po Dzogchen

In general, within the Bon tradition, there exist different lines of transmission for the Dzogchen teachings which are collectively known as A rdzogs snyan gsum. The first two of them represent Terma traditions based on rediscovered treasure texts, whereas the third is an oral tradition

(snyan brgyud) based on a continuous transmission through an uninterrupted line of realized masters. These three transmissions of Dzogchen are as follows:

1. A-khrid

The first cycle here of Dzogchen teachings is called A-khrid (pronounced A-tri), that is, the teachings that guide one (khrid) to the Primordial State (A). The white Tibetan letter A is the symbol of Shunyata and of primordial wisdom. The founder of this tradition was Meuton Gongdzad Ritrod Chenpo, who was frequently just known as Dampa, "the holy man." [48] He extracted these Dzogchen precepts from the Khro rgyud cycle of texts. Together with the Zhi-ba don gyi skor, these texts formed part of the sPyi-spungs yan-Iag gi skor cycle of teachings that belong to the Father Tantras (pha rgyud) originally attributed to Ton pa Shenrab in the guise of Chimed Tsugphud ('Chi-med gtsug-phud). To this collected material, Meuton added his own mind treasure (dgongs gter) and organized the practice of the cycle into eighty meditation sessions extending over several weeks. This was known as the Akhrid thun mtsham brgyad-cu-pa. The instructions were divided into three sections dealing with the view (Ita-ba), the meditation (sgom-pa), and the conduct (spyod-pa). Upon a successful completion of the eighty session course, one received the title of Togdan (rtogsldan), that is, "one who possesses understanding."

The system was later condensed by his successors. In the thirteenth century Aza Lodo Gyaltsan [49] reduced the number of sessions to thirty and subsequently in the same century Druchen Gyalwa Yungdrung wrote a practice manual in which the number of sessions in retreat (thun mtsham) was further reduced to fifteen. This popular practice manual is known as the A-khrid thun mtsham bco-Inga-pa. [50] And in the present century, the great Bon Po master Shardza Rinpoche wrote extensive commentaries on the A-khrid system, together with the associated dark retreat (mun mtshams). [51] The A-khrid tradition, where the practice is very systematically laid out in a specific number of sessions, in many ways corresponds to the rDzogs-chen sems-sde of the Nyingmapa tradition. [52]

2. rDzogs-chen

Here the term rDzogs-chen does not mean Dzogchen in general, but the reference is to a specific transmission of Dzogchen whose root text is the rDzogs-chen yang-rtse'i klongchen, "the Great Vast Expanse of the Highest Peak which is the Great Perfection," rediscovered by the great Terton Zhodton Ngodrub Dragpa in the year 1080. This discovery was part of a famous cycle of treasure texts hidden behind a statue of Vairochana at the Khumthing temple at Lhodrak. This root text is said to have been composed in the eighth century by the Bon Po master known as Lishu Tagring. [53]

3. sNyan-rgyud

The third cycle of transmission of the Dzogchen teachings within the Bon tradition is the uninterrupted lineage of the oral transmission from the country of Zhang-Zhung (ZhangZhung snyan-rgyud), which is the subject of the present study. Because this tradition has a continuous lineage extending back to at least the eighth century of our era, and so does not represent Terma texts rediscovered at a later time, it is of particular importance for research into the

question of the historical origins of Dzogchen. [Excerpted from Space, Awareness, and Energy: An Introduction to the Bon Po Dzogchen Teachings of the Oral Tradition from Zhang-Zhung, by John Myrdhin Reynolds, Snow Lion Publications forthcoming in 2001.]

Notes:

1. See John Myrdhin Reynolds, The Golden Letters, Snow Lion, Ithaca 1996, pp. 199-286.
2. For example, see the Deb-ther sngon-po of Gos lo-tswa-ba gZhon-nu dpal (1392-1481), translated in The Blue Annals by George Roerich, Part I, Book I, Motilal Banarsidass, New Delhi reprint 1979; pp. 35-37. See also Tarthang Tulku, Ancient Tibet, Dharma Publishing, Berkeley 1986; pp.102-106, 140-148.
3. See Geza Uray, "The Old Tibetan Verb Bon," in Acta Orientalia Academiae Scientarium Hungaricae, 1964, vol. 17, no. 3, pp. 323-34.
4. Shamanism, now recognized to be a world-wide religious and cultural activity of great antiquity, has been extensively described by Russian and other anthropologists, as well as by scholars of the History of Religions such as Mircea Eliade and others. See especially Mircea Eliade, Shamanism: Archaic Techniques of Ecstasy, Pantheon Books, New York 1964.
5. On Tibetan shamanism generally, see Rene de Nebesky-Wojkowitz, Oracles and Demons of Tibet, Mouton, The Hague 1956, pp. 538-553, as well as Per-Arne Berglie, "Preliminary Remarks on Some Tibetan Spirit Mediums in Nepal," in Kailash 4 (1), Kathmandu 1976, pp. 85-108. For an account of a contemporary Tibetan shaman from Ladakh and practicing in Kathmandu, see Larry G. Peters, "The Tibetan Healing Rituals of Dorje Yudronma: A Fierce Manifestation of the Feminine Cosmic Force," in Shaman's Drum 45, Ashland OR 1997, pp. 36-47.
6. See Joseph Rock, "Contributions to the Shamanism of the Tibetan-Chinese Borderland", Anthropos LIV (1959), pp. 796-818
7. See Larry Peters, Ecstasy and Healing in Nepal, Udena Publications, Malibu 1981. See also Stan Royal Mumford, Himalayan Dialogue, University of Wisconsin Press, Madison 1989.
8. On the relations of the old Tibetan kingdom with Central Asia generally, see Christopher Beckwith, The Tibetan Empire in Central Asia, Princeton University Press, Princeton NJ 1987. In view of this connection, as suggested by Beckwith, the term bon might possibly be a borrowing from the Central Asian Iranian language of Sogdian, where the word bwn means "dharma." This word also occurs as the first element in the title of the Zoroastrian book dealing with the process of creation, the Bundahishn. Beckwith has also pointed to a possible Indo-Iranian substratum in the Zhang-Zhung language. See Beckwith, The Tibetan Empire in Central Asia, op. cit, pp. 3-36. The Sogdians were a major trading people along the Silk Route to the northwest of Tibet and many Buddhist texts in the Sogdian language have been recovered from Central Asia. On Zhang-Zhung in particular, see Tsering Thar, "The Ancient Zhang-Zhung Civilization," in Tibet Studies, Lhasa 1989, pp. 90-104.
9. According to the bsTan-rtsis of Nyima Tenzin, translated by Per Kvaerne in "A Chronological Table of the Bon-po: The bsTan rcsis of Nyi-ma bstan-'jin," in Acta Orientalia XXXIII, Copenhagen 1971, pp. 205-282.

10. There exist three principal biographies or hagiographies of Tonpa Shenrab in the Bon tradition: 1. mDo 'dus or Dus gsum sangs-rgyas byung-khungs kyi mdo, 2. gZer-myig or 'Dus-pa rin-po-che'i rgyud gzer-myig, and 3. gZi-brjid or 'Dus-pa rin-po-che dri-ma med-pa gzi-brjid rab tu ᶠbar-ba'i mdo.

    A summery of the hagiography of Tonpa Shenrab, drawn from the gZer-myig, will be found in Helmut Hoffman, The Religions of Tibet, George Alien and Unwin, London 1961, pp. 84-98. A brief version of the hagiography may be found in Richard Gard and Sangye Tandar, The Twelve Deeds: A Brief Life Story of Tonpa Shenrab, the Founder of the Bon Religion, LTW A, New Delhi 1995. Although the monastic career of Tonpa Shenrab in his later life bares many resemblences to the account of Shakyamuni Buddha's Great Renunciation and subsequent teaching activities, as found, for example, in the Lalitavistara, his life story is otherwise of an origin quite independent of anything remotely Indian Buddhist. Indeed, the noted Russian scholar Kuznetsov sees Tonpa Shenrab as being of Central Asian or Iranian origin. See B.I. Kuznetsov, "Who was the Founder of the Bon Religion," in Tibet Journal, Vol. I, No.l, Dharamsala 1975. Certain contemporary Tibetan scholars see Tonpa Shenrab as being a native-born Tibetan, rather than a prince or priest coming from Central Asian origin. See Namkhai Norbu, The Necklace of gZi: A Cultural History of Tibet, L TW A, Dharamsala 1981. Karmay also appears to suggest this. See Samten G. Karmay, "A General Introduction to the History and Doctrines of Bon," in The Memoirs of the Research Department of the Toyo Bunko, No. 33, Tokyo 1975, pp. 171-218. Lopon Tenzin Namdak, following Bon Po tradition, is adament in asserting that Tonpa Shenrab was not a Tibetan, but originated in 'Ol-mo lung-ring, which he identifies with Shambhala. In that case, 'Ol-mo lung-ring was a mystical domain and not a precise geographical location somewhere northwest of Tibet in historical times. On the significance of Ol-mo lung-ring and Shambhala, see Edwin Birnbaum,The Way to Shambhala: A Search for the Mythical Kingdom beyond the Himalayas, Anchor Press/ Doubleday, New York 1980, pp. 12-13,44, 79-81, 102. On the signicance of mystical geography in general, see Mircea Eliade, The Sacred and the Profane: The Nature of Religion, Harcourt Brice & World, New York 1957, and also Henry Corbin, Spiritual Body and Celestial Earth, Princeton University Press, Princeton 1977.

11. On the bard and the epic generally in the Tibetan tradition, see R.A. Stein, Tibetan Civilization, Faber and Faber, London 1972, pp. 272-281. Also see his more detailed study, Recherches sur 1'epopee et le barde au Tibet, Annales du Musee Guimet, Paris 1959.

12. This does not mean that the Dalai Lama considers the Bon Po's to be Buddhists. According to most Tibetan Lamas, the Buddhists follow chos and the Bon Po's follow bon. Nevertheless, both Buddhists (chos-pa) and Bon Po's are considered "Insiders" (nang-pa), as opposed to "Outsiders" or Non-Buddhists (phyi-pa), such as Hindus, Jains, Muslims, and Christians.

13. For example, see the Grub-mtha' legs bshad shel kyi me-long by Chos kyi nyi-ma dpal bzang-po (1674-1740). The section of this text dealing with Bon has been translated by Sarit Chandra Das in Contributions on the Religion and History of Tibet, Manjusri Publishing House, New Delhi 1970, pp. 1-19; reprinted trom Journal of the Asiatic Society of Bengal, 1881. The author, a Gelugpa scholar, distinguished three phases in the historical

development of Bon: 'jol bon, 'khyar bon, and bsgyur bon. Although this is not how the Bon Po's see their own history, the text is useful in indicating how the other Buddhist schools saw them. The account found here may be summarized as follows:

a. Revealed Bon ('jol bon): During the reign of the sixth king of Tibet, Tride Tsanpo (Khrilde btsan-po), a demon or evil spirit ('dre) kidnapped a boy of thirteen who belonged to the Shen (gshen) clan and took him to different wild places in the mountains of Tibet and Kham. Other accounts add the detail that this thirteen year old boy was discovered to have had the ears of a donkey, apparently trom birth, whereupon the evil spirits absconded with him. For thirteen more years thereafter, this boy wandered in the wilderness and came to be fully instructed in the magical arts of the non-human spirits (mi ma yin). At the age of twenty-six he was permitted to return to his native village. Because of his Otherworld journeys and the knowledge he acquired thereby, he knew the names and the haunts of all the spirits and demons. He knew which spirits caused troubles among mankind and which spirits brought good luck and prosperity. And he knew how to appease hostile spirits with rituals and offerings. Thus this young man was the first to introduce Bon among the Tibetans and from his time onward, the kings of Tibet followed Bon and no other religion. It is said, moreover, that when he returned to his village from the wilderness, he hid his donkey's ears by wearing a white woollen turban, for which reason the white turban became the distinctive head-gear of the ancient Bon Po's. It was said of these early Bon Po's that below ('og) they tamed the evil spirits, above (steng) they invoked the gods of their ancestors, and in the middle (bar) they purified the hearth when it became polluted and thereby offended the hearth god (thab lha) and other household spirits. This account is an obvious scenario of shamanic initiation and thereby it would appear to account for the origin of shamanism in Tibet.

b. Deviant Bon ('khyar bon): This represented innovations made due to foreign influences coming into Tibet from the outside. When the king of Tibet, Drigum Tsanpo (Gri-gum btsan-po), was killed because of his persecution of the Bon Po's, it became necessary to prevent the restless spirit of the murdered king, which had become a gshin or restless ghost, from doing mischief among the people. Therefore, three Bon Po practitioners were invited from Kashmir (Kha-che), Gilgit (Bru-sha), and Zhang-Zhung, respectively, in order to perform the appropriate funeral rites to set the spirit to rest. This was because the local priests did not know how to do this. Such rites are known as 'Dur. All three of these Bon Po's were foreigners from countries which lay to the west of Tibet. One of these Bon Po's, presumably the one from Zhang-Zhung, propitiated the deities Ge-khod (the patron deity of Zhang-Zhung), Khyung (Garuda), and Me-Iha (the god of fire). Thereby he was able to fly through the sky on his drum and divine mineral and metal deposits hidden beneath the earth. The second Bon Po, presumably the one from Gilgit, was skilled in divination and could foretell the future by means of the knots and threads, a practice known as ju-thig, and the use of scapula (sog dmar). Moreover, he made inspired oracular utterances (lha bka'). This would appear to locate the origin of this method of divination in

Gilgit. The third Bon Po from Kashmir, a land famous for its Sanskrit learning among both Buddhists and Shaivites, was an expert in conducting the funeral ceremonies. Previously there had existed no philosophy of Bon in Tibet, but now Bon became mixed up with the Shaivite doctrines of the Tirthikas, that is, the Hindus of Kashmir, and therefore this became known as Deviant Bon (mu-stegs dbang-phyug-pa'i grub-mtha' 'khyar-ba bon).

c. Transformed Bon (bsgyur bon): This occured in three phases. First, an Indian Pandita, having slandered a famous Buddhist teacher and being charged with immoral acts, was expelled from the Sangha or monastic community. He went to the north of Kashmir and dressing himself in blue robes (sham-thabs sngon-po-can), he proclimed himself a great teacher. There he wrote several heretical books and hid them underground. After a few years, he invited the public to witness the discovery of these texts that he had hidden previously. He proclaimed them to be the sacred scriptures of Bon and thereby he brought about a transformation in the Bon religion. Second, during the reign of the great Buddhist king of Tibet, Trisong Detsan, an edict was issued requiring that all Bon Po's to renounce Bon and to embrace the Buddhist faith of India. A Bon Po named Rinchenchok (Rin-chen mchog) refused to do so and was punished by the king for his obstinancy. He became very angry at this and thereupon he and some other Bon Po priests composed Bon Po scriptures by whole-sale plagiarizing of the Buddhist ones. When the king heard of this activity, he was outraged and had these priests beheaded. However, some conspirators survived and hid copies of these plagiarized texts under rocks in various places. Later these priests rediscovered these texts and they became the Bon Po Termas.

   Third, after the overthrow and death of the Tibetan king Langdarma in the ninth century, some Bon Po priests continued to alter other Buddhist texts using different orthography and terminology. In Upper Tsang, two of them, Shengur Luga (gSen rgur klu-dga') and Daryul Drolag (Dar-yul sgro-lag), composed more texts and hid them under rocks. Thereby they converted many Buddhist scriptures into Bon texts, such as transforming the extensive Prajnaparamita (Yum rgyas) into the Khams-chen, the Bon Po version of the Prajnaparamita. Later they brought them out as apparently accidental discoveries. These caches of texts were known as "the White Water" (Chab dkar) and the Fruitional Bon ('bras-bu'i bon). The tone of the account here is rather anti-Bon and this may be contrasted with the Bon Po's own account of the origin and development of their tradition such as found in the Legsbshad mdzod of Shardza Rinpoche. See the translation of this work in Samten G. Karmay, The Treasury of Good Sayings: A Tibetan History of Bon, Oxford University Press, London 1972.

14. Oral communication from Lopon Tenzin Namdak. See also his history of Bon, g.Yungdrung bon gyi bstan-pa'i 'byung khungs nyung bsdus, Kalimpong 1962.

15. According to the traditional accounts found in the gZer-myig and the gZi-brjid, the demon prince and sorcerer Khyabpa Lagring (bDud-rgyal Khyab-pa lag-ring) stole the seven horses of Tonpa from their stable in 'Ol-mo lung-ring, and after spiriting them away, he concealed them in Kongpo, a country in Southeastern Tibet. Tonpa Shenrab took this as

an opportunity to travel to Tibet in order to subdue the fierce demons (srin-po) who at that time dwelt in the country and oppressed primitive humanity. See H. Hoffman, The Religions of Tibet, op. cit. Also see Tarthang Tulku, Ancient Tibet, op. cit., pp. 107-108.

16. See David Snellgrove, The Nine Ways of Bon, Oxford University Press, London 1967. Also see Namkhai Norbu, Drung, Dreu and Bon, LTWA, Dharamsala 1995.

17. See Snellgrove, The Nine Ways of Bon, op. cit. Also on Bon Po ritual, see John Myrdhin Reynolds, The Cult and Practice of Zhang-Zhung Meri, Bon Po Translation Project (privately printed), San Diego 1996.

18. Oral communication from Lopon Tenzin Namdak. On the conflict between Buddhist Lamas and indigenous shamans regarding the question of blood sacrifice, see Mumford, Himalayan Dialogue, op. cit. On a parallel situation in seventeenth century Mongolia, see Walther Heissig, The Religions of Mongolia, University of California Press, Berkeley 1980 and Walther Heissig, "A Mongolian Source to the Lamaist Suppression of Shamanism in the 17th Century," in Anthropos 48, pp. 493-533.

19. On 'Chi-med gtsug-phud and the lineages for the Bon Po Dzogchen teachings, see Chapter Two below and also the translations of the Yig-chung and the rNam-thar in Part Two.

20. On the Zhang-Zhung language, see Erik Haarh, "The Zhang-Zhung Language: A Grammar and Dictionary of the Unexplored Language of the Tibetan Bon Po's," in Acta Jutlandica XL: 1, Copenhagen 1968, pp. 7-43.

21. Samten G. Karmay, The Treasury of Good Sayings: A Tibetan History of Bon, Oxford University Press, London 1972.

22. On the sMar-yig script of Zhang-Zhung, see Tshe-ring Thar, "The Ancient Zhang Zhung Civilization," op. cit. Also see Namkhai Norbu, The Necklace of gZi, op. cit..

23. On the Bon Po Tenna tradition, see Samten Kannay, The Treasury of Good Sayings, op. cit. All of the early Tenna discoveries of the Bon Po's were sa-gter, that is, the actual physical texts written in previous times and concealed in various places of Tibet and Bhutan. Most of the actual discoveries of these collections of Tenna texts were not learned by Lamas, but simple fanners and hunters, who could not have possibly forged these texts. Among the most famous of these early "Tertons" were three Nepali thieves known as the three Atsaras, who in the year 961 CE stole a heavy locked chest from the Cha-ti dmar-po temple at Samye monastery. Escaping into the mountains with their loot, thinking that it contained gold they broke into the chest, but when they opened it, they found only some old texts. Greatly disappointed, they sold these old books to some local village Bon Po Lamas for some gold and a horse.

24. On the Nyingmapa Tenna tradition, see Eva Dargyay, The Rise of Esoteric Buddhism in Tibet, Motilal Banarsidass, Delhi 1977. Also see Tulku Thondup, Hidden Teachings of Tibet: An Explanation of the Tenna Tradition of the Nyingmapa School of Buddhism, Wisdom Publications, London 1986, and Tulku Thondup, The Tantric Tradition of the Nyingmapas, Buddhayana, Marion MA 1984.

25. The Nine Ways of Bon, or rather, the nine successive vehicles of Bon (bon theg-pa rim

dgu), as classified in the System of the Southern Treasures (Iho gter lugs), is expounded in as many chapters in the gZi-brjid, the most extensive hagiography ofTonpa Shenrab. These chapters have been translated by Snellgrove in consultation with Lopon Tenzin Namdak. See David Snellgrove,The Nine Ways of Bon, Oxford University Press, London 1967. Here the Nine Ways are listed as follows:

a. The Way of the Practice of Prediction (phywa gshen theg-pa): Literally theg-pa means a vehicle or conveyance, rather than a road or a way. gShen, a word of obscure origin and meaning, can here be translated as "practice" or "practitioner" according to the Lopon. And the tenn phywa means prediction or prognostication. This way or vehicle is principally concerned with divination (mo), astrological and geomantic calculations (rtsis), medical diagnosis (dpyad), and the perfonning of healing rituals (gto).

b. The Way of the Practice of Visible Manifestations (snang gshen theg-pa): This way is principally concerned with visible manifestations (snang-ba) perceived as positive manifestations of the activities of the gods (lha) who come to the aid of humanity. Therefore, the emphasis is placed on invoking the gods (lha gsol-ba) for their aid. This includes such classes of deities as the Thugs-dkar, the sGra-bla, the Wer-ma, and so on.

c. The Way of the Practice of Magical Power ('phrul gshen theg-pa): This way is principally concerned with magical rituals to ensure prosperity and control over the spirits evoked, especially the rites of exorcism (sel-ba) to eliminate negative energy and the negative provocations of evil spirits (gdon) who come to disturb human existence. The practitioner works with these energies in tenns of evocation, conjuration, and application (bsnyen sgrub las gsum).

d. The Way of the Practice of Existence (srid gshen theg-pa): Here "existence" (srid-pa) properly means the processes of death and rebirth. This way is also known as 'Dur gshen, the practice of ceremonies for exorcising ('dur) the spirits of the dead who are disturbing the living. It is, therefore, principally concerned with the three hundred and sixty kinds of rites for accomplishing this, as well as methods for ensuring the good fortune and the long life of the living. These four represent the Four Causal Ways of Bon (bon rgyu'i theg-pa bzhi). These are followed by the higher ways of a more spiritual nature, whose goal is liberation and enlightenement, which are collectively known as the Fruitional Ways ('bras-bu'i thegpa).

e. The Way of the Virtuous Lay Practitioners (dge-bsnyen theg-pa): This way is principally concerned with morality and ethics, such as the ten virtuous deeds (dge-ba bcu), the ten Perfections or Paramitas, and so on, as well as pious activities such as erecting stupas, and so on.

f. The Way of the Ascetic Sages (drang-srong theg-pa): The term drang-srong (Skt. rishi), meaning a sage, has here the technical significance of a fully ordained monk who has taken the full complement of vows, corresponding to the Buddhist bhikshu (dge-slong). The principal concern is with the vows of the monk and the rules of the monastic discipline ('dulba).

g. The Way of the White A (A-dkar theg-pa): This way is principally concerned with the Tantric practice of transformation by way of visualizing oneself as the meditation deity and the practices associated with the mandala. Here are included both the Lower Tantras and the Higher Tantras.

h. The Way of the Primordial Shen (ye gshen theg-pa): This way is concerned with certain secret Tantric practices includung the proper relationship with the Guru and with the Tantric consort, as well as with the methodologies of the Generation Process (bskyed-rim) and the Perfection Process (rdzogs-rim) and the conduct connected with them.

i. The Ultimate Way (bla-med theg-pa): This ultimate and unsurpassed (bla na med-pa) way is comprised of the teachings and practices of Dzogchen, the Great Perfection, which describes the process of enlightenment in terms of the Base, the Path, and the Fruit, as well as the practice of contemplation in terms of the view, the meditations, and the conduct.

26. The Nine Ways according to the System of the Central Treasures (dbus gter lugs) are also divided into the Causal Vehicles (rgyu'i theg-pa) and the Fruitional Vehicles ('bras-bu'i theg-pa). These are as follows:

a. The Vehicle of Gods and Men where one relies upon another (lha mi gzhan rten gyi thegpa): that is to say, this is the vehicle of those disciples who must first hear the teachings from another. This vehicle corresponds to the Shravakayana in the Buddhist system and the philosophical view is that of the Vaibhashikas.

b. The Vehicle of the Shenrabpas who understand by themselves alone (rang-rtogs gshen-rab kyi theg-pa): These practitioners do not need to hear the teachings first from another, but they discover it for themselves. This vehicle corresponds to the Pratyekabuddhayana of the Buddhists and the philosophical view is that of the Sautrantikas.

c. The Vehicle of the Compassionate Bodhisattvas (thugs-rje sems-pa'i theg-pa): This vehicle corresponds to the Mahayana Sutra system or Bodhisattvayana vehicle in the Buddhist system. In particular, the reference is to the Bodhisattvas who practice the ten Paramitas of generosity, morality, patience, vigor, meditation, strength, compassion, commitment, skillful means, and wisdom. The philosophical view is that of the Y ogacharins or Chittamatrins (sems-tsam-pa) who discern the absence of any inherent existence in terms of the internal self, as well as external phenomena.

d. The Vehicle of the Bodhisattvas that are without conceptual elaborations (g.yung-drung sems-pa'i spros med-pa'i theg-pa): This vehicle also corresponds to the Bodhisattvayana in the Buddhist system. The Bon Po term g.yung-drung sems-dpa[1], literally Svastikasattva or "Swastika being," has the same meaning as the Buddhist term Bodhisattva (byang-chub sems-dpa'). Here one finds the same practice of the ten Pramitas. However, the philosophical view of emptiness and the absence of any inherent existence in the internal self and the external phenomena is understood by way the Madhyamaka (dbu-ma-pa), rather than the Chittamatra. These four lower

ways represent the Causal Vehicles (rgyu'i theg-pa), while those which follow are known as the Fruitional Vehicles.

e. The Vehicle of the Primordial Bon of Pure Conduct and Ritual Activity (bya-ba gtsangspyod ye bon gyi theg-pa): Focusing on ritual activity (bya-ba, Skt. kriya) and purity of conduct, this vehicle corresponds to the Kriyatantrayana in the Nyingmapa system. In terms of method, the Wisdom Being (ye-shes-pa) is invoked into one's range of vision and treated as a great lord being petitioned by a humble servent, and thereby the practitioner receives the knowledge (ye-shes) and the blessings (byin-rlabs) of the deity.

f. The Vehicle of the Clairvoyant Knowledge that possesses all of the aspects (rnam-par kun-Idan mngon-shes kyi theg-pa): The focus is equally on external ritual action and internal yoga practice. This vehicle corresponds to the Charyatantrayana in the Nyingmapa system. Together with the practice of the ten Paramitas and the four Recollections, the presence of the Wisdom being is invoked, but this time the deity is regarded as an intimate friend rather than as a superior lord. These two vehicles represent the Outer or Lower Tantras (phyi rgyud), while the vehicles that follow represent the Inner or Higher Tantras (nang rgyud).

g. The Vehicle of Visibly Manifestating Compassion in terms of the Actual Generation Process (dngos bskyed thugs-rje rol-pa'i theg-pa): This vehicle corresponds to the Yoga Tantra and to a certain extent to the Mahayoga Tantra and the Anuttara Tantra in the Buddhist system of classification for both the Nyingmapas and the Newer Schools. Establishing oneself in the higher view of the Ultimate Truth and remaining in the original condition of the Natural State, one engages in the Generation Process (bskyed-rim) and transforms oneself into the meditation deity, thereby realizing the qualities attributed to that manifestation of enlightened awareness.

h. The Vehicle wherein Everything is Completely Perfect and Exceedingly Meaningful (shin tu don-Idan kun rdzogs kyi theg-pa): Becoming established in the Ultimate Truth and the original condition of the Natural State as was the case above, here one places the emphasis on the Perfection Process (rdzogs-rim) rather than the Generation Process (bskyed-rim), so that Space and Awareness are realized to be inseparable (dbyings rig dbyer-med). And particularly in terms of the meditation deity, the practitioner comes to realize the gnosis or pristine awareness of the inseparability of bliss and emptiness (bde stong ye-shes). This vehicle corresponds to the Mahayoga Tantra and especially the Anuyoga Tantra classifications of the Nyingmapas.

i. The Unsurpassed Vehicle of the Highest Peak of the Primordial Great Perfection (ye nas rdzogs-chen yang-rtse bla-med kyi theg-pa): This vehicle comprises the Dzogchen teachings in terms of the Mind Series (sems-sde) which emphasize the awareness side of the Natural State and the Space Series (klong-sde) which emphasize the emptiness side, as well as the Secret Instruction Series (man-ngag sde) which emphasize their inseparability.

On the Central Treasures, see John Myrdhin Reynolds, Yungdrung Bon: The Eternal

Tradition, Tibetan Translation Project (privately printed), New York 1994. And also Lopon Tenzin Namdak and John Reynolds (tr), The Condensed Meaning of an Explanation of the Teachings ofYungdrung Bon, Bon Po Foundation, Kathmandu n.d. Also see Tenzin Wangyal, Wonders of the Natural Mind, Station Hill Press, Barry town NY 1993, pp. 35-37, 203-208.

27. Oral Communication.

28. According to Lopon Tenzin Namdak, the translations of these technical terms chab dkar as "white water" and chab nag as "black water" are problematical. Indeed, chab does mean "water" in Tibetan, but the word may originally have been a Zhang-Zhung term and had a different and now forgotten meaning. In the old Bon Po usage, the terms "white" (dkar) and "black" (nag) did not have the moral connotations that they have in English, such as "white magic" done for good purposes and "black magic" done for evil purposes. In this context, white refers to invoking the aid of the gods and spirits, drawing positive energy to oneself, while black refers to the exorcizing and expelling of negative energies, perceived as a process of purification. The exorcised negative energies are felt to appear black in color, but the intention here is positive, namely, that of purification.

29. According to Karmay, the name Than-yul designates the district of Phan-yul to the north of Lhasa. This may have been the location where the Bon Po translation of the Prajnaparamita was made in the early period, then later concealed in a different region and rediscovered at a later time by gShen-chen klu-dga' in the 11th century. However, the Lopon disputes this theory and holds that 'phan-yul was probably a Zhang-Zhung word whose meaning has been forgotten. The Tibetan term 'bum, literally meaning "one hundred thousand," is the usual designation in the Buddhist tradition for the entire collection of the Prajnaparamita Sutras, the largest of which consists of one hundred-thousand verses.

30. See Snellgrove, The Nine Ways of Bon, ibid.

31. The Termas revealed to bLo-ldan snying-po (b.(1360), Mi-zhig rDo-je, otherwise known as rDo-rje gling-pa (1346-1405), Kun-grol grags-pa (b. 1700), bDe-chen gling-pa (b.1833), gSang-sngags gling-pa (b. 1864), mKha'-'gro bDe-chen dbang-mo (b.1868), etc., are considered recent treasure text discoveries (gter gsar). Among those listed here, rDo-rje gling-pa is also well known as a Nyingmapa Terton. On him, see Eva Dargyay, The Rise of Esoteric Buddhism in Tibet, Motilal Banarsidass, Delhi 1977. O~ the New Bon Termas in general, see Karmay, Treasury, ibid., pp. 182-190.

32. On the Tibetan translator Vairochana as a Bon Po, see Samten Karmay, The Great Perfection, Brill, Leiden 1988, pp. 17-37,216-223.

33. See Samten G. Karmay, The Great Perfection: A Philosophical and Meditative Teaching of Tibetan Buddhism, Brill, Leiden 1988. Also see Eva Dargyay, The Rise of Esoteric Buddhism in Tibet, Motilal Banarsidass, Delhi 1977.

34. See the discussion in Reynolds, The Golden Letters, op. cit, pp. 199-286.

35. Eva Dargyay, The Rise of Esoteric Buddhism in Tibet, Motilal Banarsidass, Delhi 1977. The Nyingmapa class of the Mahayoga Tantras is divided into the Tantra Section (rgyud-

sde), consisting of eighteen Tantras headed by the Guhyagarbha Tantra (rgyud gsang-ba snying-po), and the Sadhana Section (grub-sde) consisting of the texts for the practices of these eight Herukas.

36. See the translation of the Man-ngag Ita-ba'i phreng-ba in Samten Karmay, The Great Perfection, op. cit., pp. 137-174.

37. The state of even contemplation (rnnyam-bzhag, Skt. samahita) represents the culmination of the Tantric process of transformation known as sadhana (grub-thabs). Just as the visualization process begins from the state of emptiness or Shunyata, generating the pure forms of the deity and the mandala out of this primordial condition of pure potentiality, so at the conclusion of the practice of the transformation, the visualization of the deity and its sacred space is dissolved once more back into its source, the state of Shunyata. The dissolving of all the pure forms generated in the creation process (bskyed-rim) of the sadhana back into emptiness does not, however, represent a true destruction or annihilation in any absolute sense. To assert that this is the case would represent the erroneous philosophical position of nihilism (chad-Ita). Rather, it represents are-enfolding of manifest forms back into their source, where they remain in their full potentiality. Having dissolved the visualization once more, the meditator rests for a period of time in Shunyata or pure unmanifest potentiality, in what is called a condition of even contemplation (mnyam-bzhag), out of which, subsequently, the sights and sounds of normal everyday life re-emerge as the post-meditation condition (rjes-thob). The Sanskrit term samahita is cognate with the more familiar term samadhi, both of which I translate into English as "contemplation," in order to distinguish them from "meditation" (sgom-pa, Skt. bhavana). In terms of Dzogchen, this remaining in the state of contemplation is equated with being in the Natural State (gnaslugs). However, within the practice of Tantra, it is necessary to first go through this elaborate process of visualization and transformation in order to find oneself in the condition of contemplation once the visualization is dissolved back again into Shunyata. This visualization process recapitulates the creation, the evolution, and the dissolution of the entire manifest universe. But in the context of Dzogchen practice, it is not necessary to first transform something into something else in order to find oneself in the condition of contemplation. Rather, one simply relaxes and just finds oneself in contemplation at the very beginning of practice and remains thereafter in it, by whatever means. This represents the principal practice of Dzogchen, in relation to which all Tantric transformation practices are considered secondary. On this question, also see David Jackson, Enlightenment by a Single Means: The Tibetan Controversies on the "Self-Sufficient White Remedy" (dkar po chig thub), Der Ostereichischen Akademie der Wissenschaften, Vienna 1994.

38. There has been much discussion among scholars about the location ofUddiyana (Orgyan). Tucci located it in the Swat valley in Pakistan on the basis of two medieval Tibetan texts. See Giuseppe Tucci, Travels of Tibetan Pilgrimes in the Swat valley, The Greater India Society, Calcutta 1940. However, there is much evidence to indicate that Uddiyana was a far larger region embracing much of Eastern Afghanistan. See C.S. Upasak, History of Buddhism in Afghanistan, Central Institute of Higher Tibetan Studies, Varanasi 1990.

39. On Gyer-spungs sNang-bzher Lod-po and his disciples, see Chapters Three and Four below.

40. On the origin of the Mahayana in the Northwest of India, see Etienne Lamotte, History of Indian Buddhism, Louvain 1988. And on the origin of Dzogchen in the same region, see Samten G. Karmay, "A Discussion of the Doctrinal Position of the rDzogs-chen from the 10th to the 11th Centuries, in Journal Asiatique 1-2, Paris 1975, pp. 147-155; as well as his The Great Perfection: A Philosophical and Meditative Teaching of Tibetan Buddhism, Brill, Leiden 1988.
41. On the Guyasamaja Tantra, see Alex Wayman, The Buddhist Tantras: Light on IndoTibetan Esotericism, Samual Weiser, New York 1973, and also his The Yoga of the Guhyasamajatantra, Motilal Banarsidass, New Delhi 1977.
42. On the origin of the Kalachakra Tantra and of Shatnbhala, see Edwin Bernbaum, The Way to Shambhala, Anchor/ Double day, New York 1980.
43. Lopon Tenzin Namdak and other Bon Po Lamas I have spoken to have identified 'Ol-mo lung-ring with Shambhala. For a discussion of Shambhala in the Tibetan tradition in general, both Buddhist and Bon Po, see Bembaum, The Way to Shambhala, op. cit.
44. This has already been suggested by Snellgrove in In do-Tibetan Buddhism, ibid.
45. See C. Beckwith, The Tibetan Empire in Central Asia, ibid.
46. Oral communication from Lopon Tenzin Namdak. The Lopon spent two years in that region hiding from the Chinese Communists. On this region and its archeaological remains, see John Vincent Bellezza, Divine Dyads: An cent Civilization in Tibet, Library of Tibetan Works and Archives, Dharamsala 1997. Also see his article, John Vincent Bellezza, "High Country Culture: A Civilization Flourished in the Himalayas before Buddhism Reached Tibet," Discovering Archaeology v.l n.3, May-June 1999, pp. 78-83.
47. Snellgrove and Richardson, A Cultural History of Tibet, ibid. Lopon Tenzin Namdak asserts that this monk Bodhisattva was not the famous Indian Buddhist scholar Shantirakshita who later became the first abbot of Samye monastery. But see the translation of the Bon ma nub-pa'i gtan-tshigs in Chapter Six of Part Two.
48. On the A-khrid system and rMe'u-ston dGongs-mdzod ri-khrod chen-po, see Per Kvaeme, "Bon Po Studies: The A-khrid System of Meditation," Part One: "The Transmission of the A-khrid System," in Kailash v. I, n. 1, pp. 19-50, Kathmandu 1973.
49. A-za bLo-gros rgyal-mtshan, 1198-1263.
50. Bru-chen rGyal-ba g.yung-drung, 1242-1209, composed the practice manual entitled the A-khrid thun mtshams bco-Inga-pa, "the Fifteen Sessions of Practice for A-khrid." For the translation of most of this text, see Per Kvaeme and Thubten Rikey, The Stages of Akhrid Meditation: Dzogchen Practice of the Bon Tradition, Library of Tibetan Works and Archives, Dharamsala 1996. And on the A-khrid system generally, see Per Kvaeme, "Bon Po Studies: The A-khrid System of Meditation," Part One: "The Transmission of the A-khrid System," in Kailash v. I, n. 1, pp. 19-50, Part Two: "The Essential Teachings of the A-khrid System, in Kailash v. I, n. 4, pp. 248-332, Kathmandu 1973. For a translation of the hagiography of this master, see Chapter Eight below.
51. Shar-rdza bKra-shis rgyal-mtshan, 1859-1934. Shardza Rinpoche was a realized practitioner of Dzogchen who, at the end of his life, manifested the Rainbow Body. On the dark

retreat according to Shardza Rinpoche, see the monograph, John Myrdhin Reynolds, The Instructions of Shardza Rinpoche for the Practice of Vision and the Dark Retreat, Bon Po Translation Project (privately printed), New York 1992.

52. On the rDzogs-chen sems-sde, see Reynolds, The Golden Letters, ibid, and also Namkhai Norbu, The Crystal and the Way of Light: Sutra, Tantra, and Dzogchen, Arkana Penguin Books, London 1993.

53. sNya-chen Li-shu stag-rings was said to a contemporary of the Tibetan king Khri-srong Ide'u-btsan and was actively involved in the concealing of Terma texts. See Karmay, Treasury, ibid. On Li-shu stag-rings, see also Chapter Four below. The text of the rDzogschen yang-rtse'i klong-chen was reprinted in India in 1973.

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35 Bon and Jain Religion – A comparative study

Prashant Dave

Introduction to Bon

Tibet, especially Kailash Mansarovar region is the land of snowy mountains. It inspires human consciousness to imbibe and breathe in the infinity. Its grandeur and grace invites us for inner patience. It is a place where inner mystery is being unveiled, in its purest form. It is a place where inner peace and tranquility are being ensured.

No words, or mind can capture, thoughts are frozen, and I tilted on the tip of the pen cannot cling to the world, when personal prefix and suffix are invalidated, only the plane of peace and tranquility expands. We enter into a land of silence and delight. When we are disillusioned about the roaring voice of the world we can shrug off the pride, arrogance and vanity of human beings. We say goodbye to the world and enter into the abode of one's own being. It is a land of peace, tranquility and nobility. This is a land of inner contentment a meeting point of Bon and Jainism. This is the land of Mount Kailash, the land of Ashtapad. It is the most outstanding object on the surface of our own planet. It is a pure land, a land of reverence and revelation. It is a land of obeisance. It is a gifted land. The gift of the land is transparent delight, depth and silence. This is a land of grandeur and divinity. This is the abode of life. It is a meeting point of inner and outer harmony. It is an ideal of all religions and particularly for Bon and Jainism. This is the shrine of the highest level of consciousness, the consciousness of *Arhats* and *Siddhas*.

'Bon' was a way of life in ancient Tibet before the induction of Buddhism there. There is openness in 'Bon'. Its passage begins from within, from inside to outside. It emerges not from the nature but it sprouts from the self. This is an essential characteristic of 'Indo-Tibetan' religion and culture. Religion starts from self–search. World is an expansion of one's own consciousness. Myths and Legends are the natural expression of religion.

Incapability to sustain one's life molded the ethical life of the people of Tibet to be more receptive, sympathetic, equitarian, enduring and simple. Agriculture and cattle breeding were the sole occupation of the people of Tibet. They borrowed the agricultural skill and this can be a clear indication of their connection to *Rushabhdev*.

One important thing is that the region of Mount Tise and Lake Pham, which is the land of *Rushabhdev* and Ashtapad, is a part of '*Shang Shung*' culture which is related to the 'Pre Buddhist Bon Religion'.

Ref. Vol. XVI Ch. 124 H Pg. 7334-7339

Bon Religion

Bon religion consists of three parts

1. The stories and letters.
2. Singers of Riddle
3. Bon principles

A. The stories : The intentions of storytelling :

i. The intention of story telling was to disseminate ancient wisdom and to retain social structures.

ii. To retain the social relation.

iii. To improve the relation with God.

iv. To establish the relation with the ancestors.

v. To validate the awareness of one's own society.

vi. To retain the patterns of society.

vii. To maintain the world order.

Dynamics of Bon Studies

For the understanding of 'Bon religion' it is obligatory to understand the dynamics of Bon Studies.

According to French school Lalou (1957) Bon is a religion of 'Blood and Poison'.

According to Stein (1962) Bon is a different non-Buddhist nameless Religion.

According to Arian Macdonald prior to *Buddh* Religion there was nothing like 'Bon Religion'.

Geoffrey Samuel (1993) has made survey of research on 'Bon' in the west. The similar research survey was published in 1994 on Bon religion by P Kavaerne. The same author has written an article "The study of Bon in the west : past, present and future in Bon studies - 2 - (2004) "New Horizons in Bon studies" Ed. by : Samten. G. Karmay and Yasuhiko Nagano".

The West knew about 'Bon' through the English translation of a chapter on 'Bon' by Sharat Chandra Das (1888). It was from a Tibetan Buddhist scholar, Thu'u-Kwan Bi-bzang's book, 'Chos-kyi Nyi-Ma'(1881).

Religious preaching of Bon is found in The Tibetan History and Antiquities of Indian Tibet Vol I by priest A.H. Franke at the end of 19th century.

Systematic and comprehensive study of 'Bon Religion' was written by Helmut (1950, 1956, and 1961). Bon Religion is romantic in nature. In Bon religion nature is living and pulsative and they do accept *Shraman* Tradition. There are three stages of the development of Bon Religion.

1. Pre-Buddhist stage.

2. The stage in which the other traditions - secret knowledge and the alchemists influenced Bon. It also includes the influence of *Shaiva* and *Bauddha Tantra*.

3. Dramatic transformation of Bon in the form of Buddhism.

Hermanns (1965) sees Iranian influence on Buddha religion. According to P. Kavaerne (1987-163-174), it is a non-substantiated opinion as it is a claim without any decisive proof.

Snellgrove (1967) wrote "The nine ways of Bon"-(London oriental series vol-18). He studied the authentic religious literature of Bon Po. According to Snellgrove (1967) 'Bon Po' has been strongly nurtured by Buddhism. In 'Bon Po' there is nothing but Buddhism hence there was no such religion prior to Buddhism.

From the above studies two derivations can be made.

1. We cannot consistently establish the relation between pre and post Buddhist Bon religion.

2. 'Bon' is a different form or transformation of Buddhism.

These derivations ignore the present study of Bon Po's literature. Present study of Bon Po does assert that 'Bon' is a valid, legitimate and historically different religious tradition.

There is a need to investigate and re-construct the Pre-Buddhist 'Bon' religion. According to P Kavaerne "I would emphasize that an adequate and coherent description of the religion of this period is the single most important task in the study of Bon" (2004). The period prior to Tibetan Buddhism is the period of emergence and fixation of 'Bon' religion.

A comparative study of Tibetan and Buddhist religion is necessary. Such studies are made by Blondeau (1971), Karmay (1988), and Mimaki (1994). Such authentic studies will establish the original form of 'Bon' religion. Such studies do show that 'Bon Texts' have influenced 'Buddhist Texts'.

The study of 'Iconography' will be helpful in establishing the 'Bon' religion. This would establish the identity and uniqueness of 'Bon' religion. The derivations of iconographical study of Bon by Kavaerne (1995) and Namkhai Norbu (1995) are very important.

According to them

1. 'Bon' religion is a unique tradition of Tibetan Wisdom.

2. 'Bon' is inherent to the 'Pan Asiatic *Shamanism*.'

To establish a historical and cultural context of Bon religion will be a meaningful academic enterprise. This will also become an academic obligation to express solidarity with Tibetan people.

1888	**Sarat Chandra Das**	Chos-kyi nyi-ma (Translation) (1801)
1890 to 1910	**A. H. Francke**	A History of Western Tibet Vol-I Antiquities of Indian Tibet- Vol-II
1950 1956 1961	**Helmut Hoffmann**	Scholary-comprehensive study Nature-Romantic Animism-Shamanistic Perodic Development of Bon
1965	**M. Hermanns**	Iranian Religious effect on Bon
1967 British Tibetologist	**D.L. Snellgrove**	Bon- A-Buddhist Religion : Different Type No-Pre-existence of Bon
1951 1952 1957 Franch Tibetologist	**M. LaLou**	Bon-A-Religion of Blood-Poison
1962 1985 1988	**R. A. Stain**	Bon-A-nameless Religion
1971 1990 1996	**A. M. Blonday**	Comparative study-Buddhist Text is influenced by Bon
1972 1988	**S. G, Karmay**	Comparative study-Buddhist Text is influenced by Bon
1994	**K. Mimaki**	Comparative study
1995	**P, Kavaerne**	The Iconographic study of Bon-Existence of pre Buddhist Bon
1995	**Norbe. Namkai**	The Iconographic Study of Bon-Panasiatic shamanism

A comparative study of "Bon" And "Jain Religion"

The two established roads of the ascendance of consciousness are:

1. Bon
2. Jainism

The land on which these two religions sprouted is a land of *Tise* (Mount Kailash), *Ma Pham* (Mansarovar) and Ashtapad.

Understanding of 'Indo-Tibetan' Religion

Generally Bon and Jainism are understood as a process from "Outer to Inner" – "From Nature

to the self". This approach is governed by 19th century romantic approach to nature. According Edward Caird - "In the development of religion we look out before we look in, and we look in before we look up."

In the first stage we perceive the external world, then we look inward and in the last stage we look upward. First we see God in nature, then we see God within us and then we see God in one's own consciousness.

However, this is not the correct approach to understand and it does not reflect the real nature of "Indo-Tibetan" religion. The approach of "Indo-Tibetan" religion is from inner to outer – from internal to external. Truth first dawns in our own inner recesses and what is external is nothing but an extension of it.

The voyage from the inner world to the outer world is nothing but a cognitive extension of consciousness. It is the nature of human knowledge that it is self – challenging – it is self-reflexive. Self-reflexivity is the inbuilt mechanism of human knowledge. That is the reason why men can dethrone the pressure of one's own tradition. Man can abate one's own tradition and can bring new cognitive revolution. This cognitive revolution will bring an existential change. It would be a qualitative change in consciousness. Our interpretation of the world would change. This is the real nature of 'Indo-Tibetan' religion.

With this approach Bon and Jain religion must be studied.

1. Commonness of the meaning of Bon and Jain

The meaning of '*Bon*' is to invoke or to seed.

To invoke the Truth, a pure state of consciousness must be acquired by one's own pursuit. Seeds of permanence are to be sprouted by an individual. To live and invoke infinity within the finite is the essence of the Bon experience.

The meaning of *Jina* is to conquer. *Jina* is a conqueror of indiscrimination – love and hate and desire. One who is dispassionate and detached is *Jina*. One who lives in the abode of eternity is '*Jina*'. Thus the meaning of '*Bon*' and '*Jina*' both are almost similar.

2. The ultimate state of being in 'Bon' and 'Jain' religion are very close.

The ultimate state is *Bonku* according to Bon religion. *Bonku* is a state of existence in which animalism has been completely demolished. Hence, *Bonku* is a pure state of consciousness which is beyond casualty. It has an untainted existence, where living in a sensual world is not hampered by it and where knowledge is pure and direct. The philosophy of Bon is the realization of the pure self.

According to Jainism complete annihilation of love and hatred brings '*Vitragata*' – self-purification. It is a state of harmony. They attain the highest state of being which is known as '*Parmeshthi*' meaning supreme state. It is the highest state of consciousness which is known as the state of *Siddhas*.

Thus the ultimate state of Bon and Jainism are almost similar

This state of consciousness can be achieved through the process of cognitive transfer.

3. 'Bon' and 'Jainism' accept the process of cognitive transfer necessary for the attainment of the highest state of consciousness

Through the Cognitive change in consciousness the highest state of being can be achieved. It is '*Sgom Dhyan*' that brings inner change. All sins, all wicked thoughts, turn into wisdom. All visible and invisible objects enter into the pure region of *Bonku*. It is the region of pure consciousness and this is the basic essence of cognitive change in '*Bon*'.

Jainism also accepts cognitive change in consciousness. This cognitive change is possible through equanimity in thought and action. Non-duality of thought and action in all walks of life and in each act is the surest way to attain the highest state of consciousness "Equanimity in one's own being and with others is the essence of Jainism. Vigilantly one must follow it in all walks of life. To feel the other person's suffering as one's own. This feeling of equanimity alone can bring about a qualitative change in consciousness.

Thus 'Bon' and 'Jainism' accept "cognitive change" as an instrument to achieve pure consciousness.

4. The cognitive change of consciousness must be self earned and self born.

The truth is not acquired through *Shastras* but it should be self generated. Self purification is achieved through self effort. It must be self born.

This is accepted by both Bon and Jainism.

"Vision of Bon" or the state of *Bonku* is self born. Truth is a matter of self acquisition. It is acquired only through personal efforts, *Shastras* and traditions are just instrumental. They have only an instrumental value to strengthen one's own efforts.

According to Jainism self-purification is the ultimate goal. Self purification should be a perennial pursuit of life. This is an inner voyage. Jainism has charted this inner voyage very systematically and authentically. This inner voyage ought to be self-trodden.

5. 'Bon' and 'Jainism' both accept the annihilation of *karmas* as a vital means to achieve self-purification

'Bon' do understand the impurities in life and that it is a poison. They come from the outside - from the demons. It is not something given in one's own nature. Impurities are not in one's mind or in one's own nature. These impurities bind us like an evil spirit. To break the cycle of *karma*, physical and spiritual purity is needed. Thus the annihilation of *karma* is important for 'Bon'.

According to Jainism desire is the motivating force of *karmas*. Ignorance and attachment predominant factors in human personality, which need not allow us to capture the right knowledge. Suffering according to Jainism is caused by ignorance and attachment, which hinders the path of Truth. Through right knowledge and by the annihilation of attachment one can rise beyond the state of suffering.

The analysis of *karma* is very basic and unique of its own kind. In Jain tradition *karma* is the product of attachment and hatred. It hinders the true knowledge of the self and

clings to the self. In Jainism, annihilation of the *Dravya* and *Bhav* is very important. It is essential to earn self purification.

Thus 'Bon' and 'Jainism' asserts the annihilation of *karma* as essential. It is inevitable for self purification. We must admit that Jainism is more subtle and authentic than 'Bon', in establishing an analysis and in the process of annihilation of *karma*.

6. 'Bon' and 'Jainism' both accept the expansion of self purification through 'oneness with the other' the feeling of other as me" – '*Aatmopamya bhav*'

For 'Bon' and 'Jainism' "science of the self" is not an idea but a practice. It is not a theory but a way of life. In the highest state of 'Bon' a state of wisdom is formed, in which all sins and sinful thoughts are transformed into wisdom. With this wisdom differences are melted and equanimity is experienced in each and every part of the world - animate or inanimate.

Jainism very emphatically accepts that equanimity is a way of life.

'Karemi Bhante Samaiyam'

O Lord, I accept equanimity. This is a vow. This is a kind of feeling where in the other is me. It is expressed in all experiences of the world. This view of life is '*Ahimsa*'- It is a unique feature of Jainism and is to be retained and preserved by all human beings.

This commonality between 'Bon' and 'Jainism' indicates that, these two religions are life oriented and self oriented. Spirituality is not an ism nor a theory but a way of life. For these two religions, peace and equanimity is the way of life. Before thousands of years in the noble land of silence and tranquility these two religions were living in total harmony. Let us salute the pious land - the land of Kailash and Ashtapad.

Chapter - 09

Concluding Article & Proposal

• People of Tibet	Photo Gallery
• Final conclusion - Looking for the "Lost Tirth"	Sajjan Jain & Rajnikant Shah
• A Proposal for further research	Rajnikant Shah, Mayur Desai & Ajit Shah

Introduction

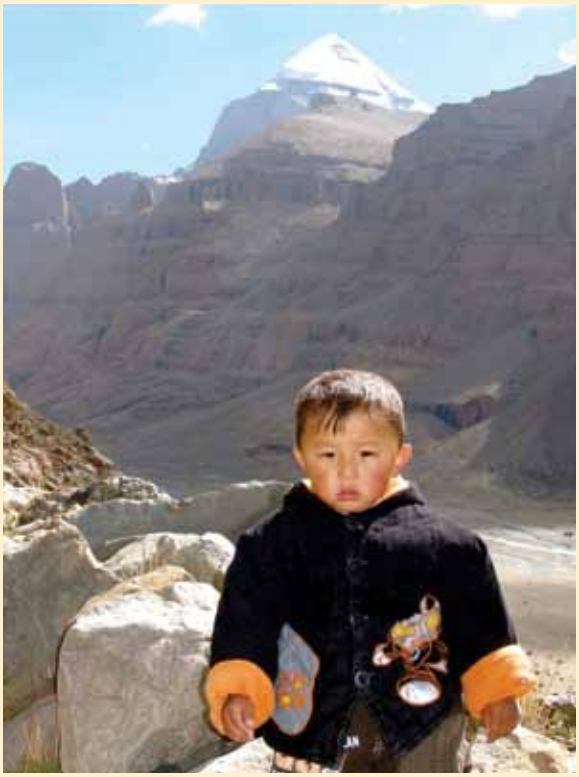
A final concluding article is given here summarizing all the work done on Ashtapad and various related topics by Sajjan Jain. This is followed by a proposal for the work to be done in future. In this proposal we are giving some suggestions on how to carry on further research work at higher levels. We have suggested taking help from various research institutions and permission from various governments. We will need a team of scholars and scientists and their input about archaeological, anthropological, philological, methodology and other possible multi-disciplinary scientific information.

Photos of People of Tibet who we saw or met on the way to Kailash are included here.

People of Tibet

Annual flag changing ceremony

Prayer by Lamas



A Child at Kailash

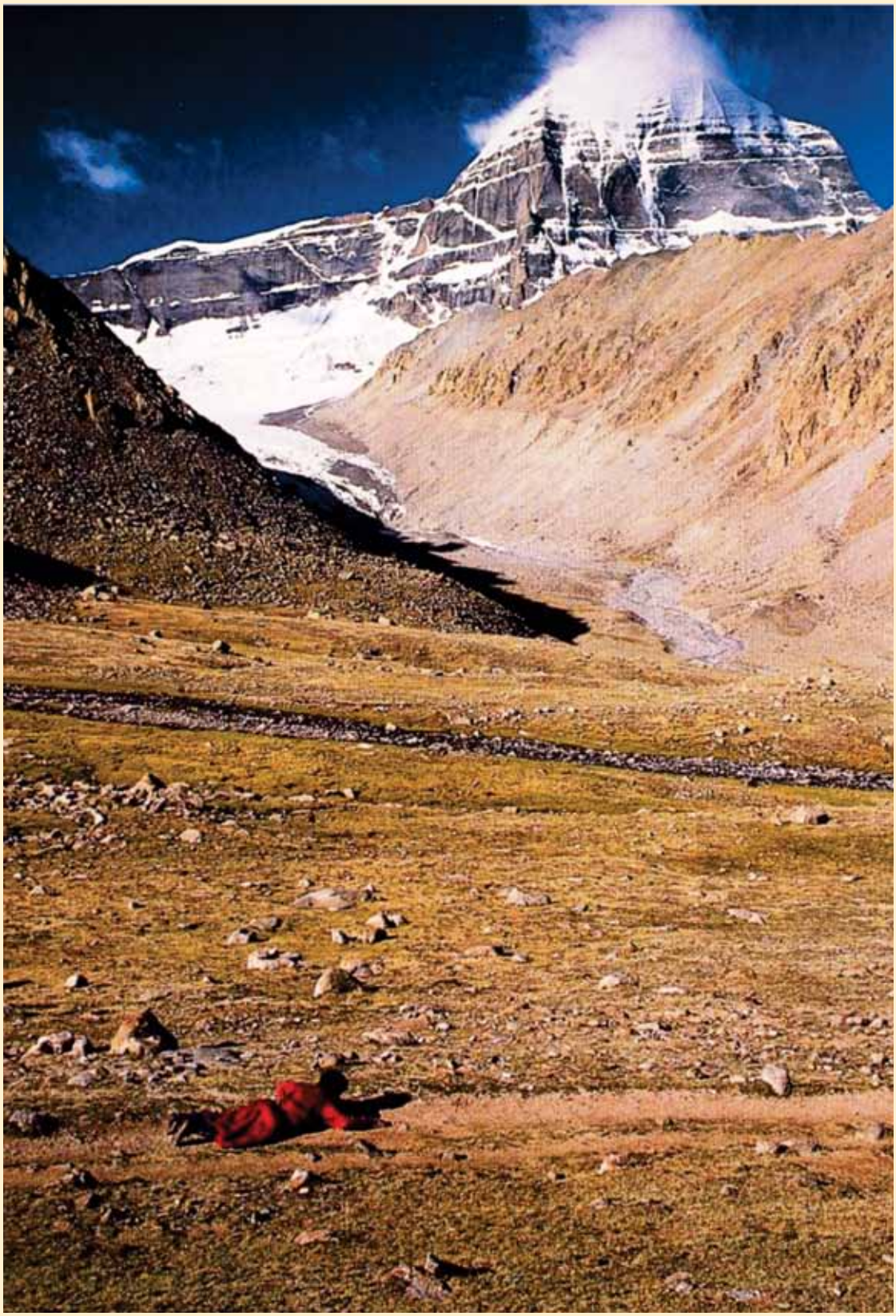
Tibetan Children

Lady discussing with Lama Dorji

Tibetan Children

It is time to relax after the arduous expedition to Inner Kora. Bharatbhai with local Tibetan ladies at Darchen

2007 team members discussing the survey plan in the inner Kora with the Swiss lady



Pilgrim doing full body length prostration around Mount Kailash to express respect to spiritual beings.

Moksh Dwar

Start of Kora - Day one

36 Final conclusion - Looking for the Lost Tirth

Sajjan Jain & Rajnikant Shah

I. Shri Ashtapad Maha Tirth

As per Jain scriptures, Bhagwan Rushabhdev attained Nirvana on Ashtapad Mountain and in his memory his son King Bharat constructed a palace with real gem stones and installed 24 idols of Jain Tirthankars on Ashtapad. In Sanskrit, asta means eight, pad means steps implying that there are eight steps to reach the mountain or temple and palace of Ashtapad.

This is one of the five major Tirths in the Jain Religion and is thought to be lost. It is believed to be situated in the tranquil heights of snow clad Himalayas. Jain Center of America, New York (JCA) is trying to re-discover it. In recent history, no one has witnessed the actual Tirth as described in the scriptures. Pilgrims and visitors travel to Kailash region where this Tirth is believed to be lost. Many individuals and organizations are involved in research to unravel the mysteries of this legendry palace.

Bharat Shah visited the Kailash region several times prior to Ashtapad project and made a detailed photographic survey of Mt. Kailash and its surroundings[1]. Review of Nandi Hill facing Mt. Kailash with natural step like physiography and apparent sculptures of various shapes such as lion, sages etc. made him determined to look further into the subject.

In the year 2000, the idea to discover the "Maha Tirth of Ashtapad" was conceived and the work on the project was initiated. This article basically summarizes the efforts of team members in carrying out the research in locating the Ashtapad Tirth. Three research trips were organized by JCA to visit and research the Kailash Mansarovar area from 2006 to 2009[2]. In these trips many scholars and scientists were involved. The main objectives of these field trips were to locate the Ashtapad palace as described in the scripture and to enlarge the knowledge obtained from earlier visits and research.

II. Survey of Ancient Scriptures

Most of the work and research for the Ashtapad project was carried out in India and U.S.A. The initial research comprised of many aspects but the logical approach was to begin with the survey and review of ancient Jain scriptures containing references to Rushabhdev and his life history, details about his place of Nirvana and in particular about the description of Ashtapad palace built by his son King Bharat near Kailash mountain. References about the Maha Tirth were also found in the religious books of Hinduism. The other important data and information was obtained from the books written in Tibetan language including visit to Tibetan scholars

For the information of the reader, Egyptian pyramids have eight steps

1) Shri Bharat H Shah report Ch 2, see Granth II, 2) For reports on field trips, see Ch 2, Granth II

and the library in Dharamshala in Himachal. The Jain Munis, Sadhus, Yogis living in the Himalayas and many other spiritual leaders residing all over India and abroad provided useful information. Some of the ancient scriptures surveyed like "Kalapsutra" on page 199 clearly states that "Arhatrishabha", the Kasalin, attained parinirvana while sitting cross legged in meditation on the summit of mount Ashtapad". Similarly, Shri HemchandraCharya provided detailed description of Ashtapad palace built by King Bharat as described in Granth I.

The review of ancient literature confirms that Rushabhdev attained Nirvana from Ashtapad and a palace/temple was built by King Bharat in his father's memory and the palace existed at least until 2600 years ago when Gautam Swami visited the temple. He climbed up with the help of sun rays. He stayed overnight and worshiped all twenty-four Tirthankar Pratimaji. Taking in consideration all these facts from the scriptures, one thinks that Ashtapad existed 2600 years ago and it survived thousands and even lacs of years since Bharat Chakravarti had built it after the *Nirvana* of Bhagwan Rushabhdev on Ashtapad. Dr. Kumarpalbhai Desai, in his foreword has done a critical analysis of all the scriptures and has evaluated the views of modern researchers and authors.

III. Human Life, Growth of Civilization and Religion

In January of 1995 a team of international geologists working on climate shift and solar radiations have hypothesized in a BBC documentary that the human life may have been formed in Tibet[3]. The finding of Ms. Maureen Raymo of M.I.T at Cambridge, MA appeared in Hong Kong based South China Morning Post sometime in January of 1995. All human life is formed out of the uplift of the Tibetan plateau[4]. In addition, famous geologists Medlikar, Blenford & Lampburse have considered Himalaya to be native place of all human beings. Prof. L.V. Holstead of Nigeria also thinks that the human civilization may have originated from Himalaya. According to Mr. Parjitar, human civilization started near Kailash[5]. However, no formal archaeological studies have been conducted to investigate this hypothesis.

It is believed that all the four religions i.e. Jainism, Buddhism, Hinduism and Bon Po flourished at the footsteps of Kailash. According to MIT research and other reports, civilizations started here. As for local history, the Shang Shung Empire flourished in those days. One also has to believe both had their roots in Kailash. Bon Po religion is the indigenous religion of the area which has lot of similarity with Jain religion. Further review and research on Bon Po religion and studying the relation between Shang and Jian-Tibetan people is continuing and we hope to find some useful information about Rushabhdev's era in Kailash region.

IV. Agriculture and Lord Rushabhdev

During the early period of human civilization, man was completely dependent on nature for all his needs. The nature which includes trees and forests provided almost all that the man needed at that point of time. Jain scripture and mythology, KALP VRUKSHA or Trees describe this phenomenon. Jain scriptures further describes that Rushabhdev taught ASI, MASI & KRISI

All this material collected were put together in XX volumes. Two DVDs were supplied with Granth-I. Dr. Kumarpal Desai article in the beginning of this Granth provides additional details.

3 (Vol XII / Ch 86 Art H/ Pg. 5467-5583), See DVD

4 (Vol IV/ Ch 21, Art L/Pg. 1231), See DVD

5 (Vol IV/21F/P.1193-1201), See DVD

which means defense, art and agriculture. This leads us to believe that Rushabhdev's reign must predate the first evidence of cultivation. For historical perspective refer to articles by Dr. Lata Bothra and Shri Devendra Muni in Granth I.

In the early civilizations, people lived near banks of river for water. With the passage of time as civilizations matured, people migrated along the river routes as demonstrated by Harappa and Mohan-Jo-Daro excavations along Sindhu river valley which proves the above hypothesis. This civilization is estimated to be approximately 7000 years old B.C.

V. Publication of Shri Ashtapad Maha Tirth Granth I and Granth II[6]

To learn more about Ashtapad, a lot of literature was collected from scriptures and compiled in XX volumes. These articles have been reviewed and a 10% selection of them which amount to 1000 pages have been published in 2 parts, Granth I and II.

Chapter 1 of Granth I contains original articles from scriptures. Some articles are complete while others are abstracts which are related to Ashtapad. Chapter 2 has analytical articles by various modern authors. Chapter 3 has summary about Rushabhdev. Chapter 4 has story of King Bharat, Gautam Swami, and other stories related with Ashtapad. Chapter 5 has Ashtapad Pooja by Shri Deepvijayji M.S. Chapter 6 is about Jain Center of America. Chapter 7 discusses about Ashtapad. The last chapter includes a selected index with cross reference as per code from Volume I to XX. List of Author's and subjects as well as a list of reference books is also given.

VI. Construction of Temple at JCA, NY[7]

In 2000, planning to reconstruct the temple began in earnest. Within five years of planning andconstruction, the building was completed in 2005. The architectural design and planning of this divine place stays true to the multiple codes and ethics of the Jain Religion and satisfies the need for place of worship for Jain Community. Various aspects of Jain beliefs are displayed through 600 objects of sculpture, artwork, paintings, posters, pat, panels and narratives throughout the building. This Jain Center aims to absorb the mind, body and soul of every one that comes to its doorsteps.

The new four-story complex with cellar represents all of the various traditions of our faith which include Shri Mahavir Swami Temple and Sthanak- Lecture Hall on 2nd Floor, Shri Aadinath Temple and Shrimad Rajchandra Meditation Hall on 3rd Floor, Dadawadi and Ashtapad Maha Tirth on 4th Floor. The JCA complex is becoming an example for all Jains throughout the world as a model for Jain Unity despite Diversity of our Traditions, following the principle of Non Absolutism.

VII. Preparation and Installation of Crystal Model of Ashtapad in the Temple at NY[8]

Ashtapad Mountain - The Mountain is made of crystal quartz. The rough crystal stones weighing 30 tons were imported. After processing and carving, the final weight of the mountain is 7.5

Publication of Shri Ashtapad Maha Tirth, Granth 2 is in your hands. These 2 parts of the Ashtapad Granth are one of a kind. Literature on Ashtapad has never been compiled and there has not been a granth written exclusively on Ashtapad ever before.

6 See attached DVD 1

7 Refer Granth I, Chapter 6.

8 Refer Granth I, Chapter 7

tons and is supported on a 1 ton steel frame. 59 blocks of crystal, each weighing 100 to 700 lbs, were assembled to provide a sloping pattern on the front and sides. Eight steps are carved in the center leading to the first row of the niches. 24 niches are sculpted in the mountain itself, where the idols are installed. Idols of 24 Tirthankars - Shri Chovisi - The 24 idols are carved to represent the 24 Tirthankars. All idols are carved out of various colored gemstones and have been installed as per their position according to religious guidelines. Various stories related to Ashtapad carved in gemstones were installed on the mountain.

The Ashtapad Model, 3 Chovisi which include 72 idols of past, present and future Tirthankars and other idols were exhibited in many cities in India and abroad. This was organized to raise awareness so that people around the world could pay their respect to all the 3 Chovisi and the Ashtapad Tirth.

VIII. Review of Technical Literature Pertaining To Kailash/Ashtapad/Himalayas

Research Team Members Meetings and Discussions

The Research Team Members included were from India and U.S.A. The meetings in U.S.A were held in New York and New Jersey area. Frequent meetings were held at Ahmedabad including office visits and at home for discussions. Majority of the members are from Ahmedabad and they helped a lot in putting the things together. Major work was done under auspices of Jain Center of America, New York and later on, the work was carried out in association with Lalbhai Dalpatbhai Institute of Indology at Ahmedabad. Many research oriented seminars were held at Ahmedabad and Mumbai. Several papers included in this Granth were also presented during the seminars.

After initial brief discussion about the project in the meetings, it was realized that it is important to know about the Rushabhdev era time-frame with respect to present and glacial history of the Kailash region where Ashtapad palace was built. Regular members meetings used to be held and discussions now focused on finding the environment, geology, culture, religion, birth of Himalayas etc. surrounding Kailash region.

These meetings and discussions led members to make research on the internet, make personal calls to experts, contacting agencies like NASA who could be useful for the project. The members of the team residing in India carried out similar research and provided useful input to the project data bank. Some of the relevant research papers particularly on Rushabhdev era, disappearance of Ashtapad, Geology, Climate, Glaciation, and Religion of surrounding Kailash region were presented at various seminars. The compilation and review of research data was helpful in planning the field trips to Ashtapad and will be good references for future field trips. All the research related articles, papers read at seminars, and various review articles were compiled in XX volumes and now a 10% selection of the material including index with cross reference is being presented herewith in a DVD format.

IX. Geology[9]

Considerable literature has been devoted to geology as the team was trying to understand the role that the geological forces may have played in this land and physiography during

9 Refer to Ch 4, Granth II

establishment and subsequent disappearance of Maha Tirth. Geologically, Himalayas are a part of the great mountain building belt extending west to east. The Himalayan belt is tectonically active and the constant movements are recorded causing earthquakes. This orogenic belt is situated between the two continental masses, the Indian Peninsular mass in the south and the Eurasian continental mass in the North.

This area has also undergone many extreme glaciations (cold) and interglacial (warm) climatic changes. The project team studied these geological forces and its impact on possible disappearance of Maha Tirth; however; no definitive conclusions have been arrived at, to date. Interesting physiographic features resembling human sages, bullocks, cows, lions, carved temples and step like structures in the mountains looking from faraway mistaken for some archaeological monuments. After close scrutiny they were found to be the natural rocks sculpted by natural erosional agents such as wind, running water, and glaciers that have shaped the rocks according to their hardness.

X. Archaeology[10]

Archaeological sites of Paleolithic (roughly 100000 to 30000 years) and Neolithic (~7000 years) culture exist in Tibet, particularly in south Tibet, near Mt. Kailash. Recently human hand and foot prints have been found in hot spring travertines at an elevation of 4200 meters. Some foot prints are larger than those expected of the present day inhabitants. The age of these foot prints is estimated at about 20,000 years old. From these findings, following observations can be made:

(i) The oldest evidence of man in Tibet is dated about 30,000 years. (ii) A second phase of human occupation occurred during the Neolithic period, around 7000 years (early and middle Holocene). (iii) Mid Holocene conditions provided evidence for enlargement of areas favorable for grazing.(iv)There is evidence that early hunters used the Tibet area during the warmer and wetter interglacial period.

There are natural caves at a height of around 5900 meters in Kailash and abandoned settlements on a curvilinear ridge above Gyangdrag Gompa. The former looks recent whereas the latter goes back to the historical period. A formal statement on this can be made once these structures are investigated by the geo- archaeologist preferably having expertise on mountain archaeology.

XI. Climate[11]

Climatic data of Tibet is available for the past 40,000 years. The data consists of environmental temperature based on oxygen-18 method from ice cores, thickness of ice sheet in Tibet and inferred lake levels etc. For western Tibet detailed climate record are available for the past 13000 years. From these studies, it is possible to make the following observations.

Higher lake levels existed between 40000 and 30000 years. It is likely that the first appearance of prehistoric man coincided with periods of high lake levels.

The data show three periods of high temperature, the most recent warm period had an onset about 12000 years ago.

10 Refer to Ch 5, Granth II
11 Refer to Ch 6, Granth II

Ice cores from Tibet studied by Dr S. K. Gupta at Physical Research Laboratory by Oxygen-18 method show three relatively warm periods i) 32-36 thousand years, ii) 24 to 28 thousand years, and 12000 years to present. The intervening periods were very cold and ice thickness on Tibetan Plateau was significantly large. The cold and harsh climatic condition may have put constraints on development of civilization.

The deeply incised glacial basins around the Kailash are the outcome of the prolonged glacial action. There are direct evidences of extensive glaciations in the region in the form of lateral moraines suggesting that the glaciers were more extensive compared to the present.

XII. Nature

Thousands of years ago people worshipped nature, sun, wind, earth, rain and other things in nature. They treated them as god if one goes to Japan, China, Oriental countries and India. As we learned more- as time progresses now we have started understanding the nature, sun, moon, rain,earth, wind, etc.

As civilization grew religion started coming up and accepted natural powers as God in the beginning. Now everything is being evaluated on scientific basis as well.

In Kailash Mansarovar area when one travels, we see the snow-capped peaks, melting of snow and glaciers during summer in lower reaches of the mountains, formation of streams, rivers, lakes like Mansarovar and Rakshas Tal, plain or Barkha valley, very little grass, no trees, few animals and birds - all that one sees and finds is just pure nature in its virgin or raw form practically untouched by human hand.

If we look at the mountain, we see step like structures of the mountains as if it is carved by humans. Again carved by nature could be another possible explanation. And because of weather, stones keep breaking and sliding down and only leaving behind partial step formations. In the end, some mountain structures stay strong, while others remain brittle and breakdown.

XIII. Time Period- Timeline[12]

The review of ancient literature confirms that Rushabhdev attained Nirvana from Ashtapad and a palace/temple was built by King Bharat in his father's memory and the palace existed at least until 2600 years ago when Gautam Swami visited the temple. Time period scale, dates and duration mentioned in the scriptures cannot be converted into present time period and appears to be difficult to understand and therefore cannot be practically used[13]. Rushabhdev era is still unknown. It can best be estimated and this appears to be the weakest link so far in the entire research project in locating Ashtapad.

The research article by Dr. Rajmal Jain included in the Granth II estimates that Rushabhdev era existed somewhere between 10000 to 14000 years from present. This estimate may be questioned by the readers of this Granth and or future researchers. This can only be verified when Ashtapad ruins are discovered some day and their age determined.

Besides difficulty in estimating the time period, distances in particular from Ayodhya to Ashtapad is uncertain. As per scriptures, Ashtapad is located twelve and a half *Kosh- yojan* north of Ayodhya and is visible from Ayodhya on a clear day from a high point. If this is true, why are we

12 See Timeline chart in this Granth

13 Refer to Shri Raman Lal and Shri Jitendra B Shah's article Granth I.

looking for Ashtapad in Kailash region- thousands of miles away from Ayodhya? Another question arises- if this is the Ayodhya? Some people believe that Ashtapad is near Badrinath.

XIV. Field Trips to Kailash/ Ashtapad Region

After survey of ancient Jain scriptures confirming the existence of Ashtapad Palace and review of scientific and technical literature. Site exploration and reconnaissance trips were planned to Ashtapad in the Himalayas. Three field trips were organized in the summer of 2006, 2007 and 2009. The team consisted of Engineers, Geologists, Archaeologists, Jain, Sanskrit and Tibetan Scholars, Space Scientists along with translators and photographers.

From the first two trips in 2006 and 2007, it was established that there could be nine or as much as ten potential sites where a possibility of Ashtapad exists. The aerial photographs of these potential sites were obtained from Geo Eye, IKONOS Data and the Indian Space Agency in Ahmedabad and were analyzed to generate a 3D model of the region.

The third trip to Kailash was taken in 2009 under the guidance of archaeologist Dr. Bellezza, who has considerable experience in the exploration of archaeological findings in the Tibetan region. The team mainly explored south side of Mount Kailash, also known as Inner Circuit and visited the potential Ashtapad sites including Ashtapad peaks, Serdung Chuksum, Gyangdrag and Dharma King Norsang. The trip concluded that absolutely no physical evidence of the existence of Ashtapad was found on the Mount Kailash, therefore Ashtapad in the form of Jain temple complex does not exist there. The report also states that the extremely thin and poorly developed alpine soils of Mount Kailash tend to keep archeological remains in or near the surface which are readily detectable on the surface unless landslides or some other catastrophic natural events covered the ruins, rendering visual detection impossible. Dr. Bellezza further support their findings by indicating that building a temple 16000 feet above mean sea level, on slopes and summits was not a viable alternative since environmental conditions at these extreme elevation preclude any such construction.[14]

Overall Dr. Bellezza concludes his report findings by stating "given the findings set forth in the report, Ashtapad being Mount Kailash itself seems the most likely prospect". Views of Digambar tradition support this view. Dr. Bellezza has probably assumed that weather conditions at the time of construction of Ashtapad palace were similar to what it exist now which may not be true because if Rushabhdev meditated there, the environment at that time in the area must be comfortable for human habitation and survival.

Various authors have interpreted the research data including field reports and have given their opinions regarding period of Rushabhdev, location and existence of Ashtapad, ruins and apparent appearance of the mountains, etc. Their interpretation may not hold true as per the scriptures. As per Dr. Rajmal's[15] calculations, Rushabhdev's age is between 10 to 15,000 years ago. This has given us a guideline to go back to 10 to 15,000 years with the help of present scientific methods available. Ice age and civilization, etc. comes around that period. So for practical purposes if we can prove that much it will help us to go back further in past. No one has to agree with various authors' opinions till Ashtapad is found.

14 See Dr. Bellezza article, Ch 2, Granth II
15 See Dr. Rajmal article, Ch 1, Granth II

XV. Ashtapad Research International Foundation-ARIF

The Ashtapad Research International Foundation (ARIF) was founded not only to bring together the resources necessary to locate the palace but to create awareness about Ashtapad and its past glory. The entire team has worked assiduously to bring together the people and resources necessary to make this project viable and vibrant.

ARIF team had been working on the following tasks:

- We are collecting literature on Ashtapad from scripture and have published it in XX volumes including an index booklet with cross-references.
- We held three seminars at Ahmedabad & Mumbai and planning for an International seminar.
- We have visited Dharamshala and we are coordinating the studies from Tibetan literature and Bon Po - the indigenous religion of Tibet at that time.
- We have already undertaken three field trips to KM region to do preliminary research work.
- Satellite studies have helped us a lot in trying to locate the buried structure. We are also trying to get high resolution satellite data for better interpretation.
- A proposal for research on Ashtapad may be sent to many research institutions around the world and to International Geological Correlation Programme (IGCP) at UN.

Thanks to the financial, technical and intellectual support of several individuals, we have been able to sustain the ongoing projects of ARIF. The project has recently moved into a new phase of initiatives, and as a result, we need additional funding to support our activities. We are currently seeking the financial support from individuals, major research institutions and religious trusts alike. We welcome your participation in this research work.

ARIF proposes to conduct a scientific study using a multi-disciplinary and coordinated effort to find the ruins or the evidence of historic Ashtapad Temple/Palace location.

XVI. Suggested Plan of Action- How to go about carrying the Proposed Research

A proposal for further research is submitted in the next article of this chapter. The proposed research plan in the next article includes the use of Remote sensing and other advanced techniques to identify Ashtapad site and its buried palace. The use of advanced techniques is relatively expensive. It would be wise not to proceed and spend money unless we firmly formulate the proposal or plan and critically reviewed by a team of experts experienced in Remote sensing technology, working on high altitude environment, familiar with Kailash mountain terrain and topography so that proper selection of instruments/equipment can be made. Some of the newer methods that can be used to explore Ashtapad and its ruins are suggested and are listed below[16]:

- Remote Sensing/Air Borne-Space Imagery to determine potential Ashtapad sites and buried objects.
- Ground Penetrating Radar (GPR) to find hidden objects possibly temple ruins underground.

16 Refer chapter 1, Granth II for newer methods.

- Radio Carbon Dating of Mansarovar area sediments to establish climate and environment during Rushabhdev era.
- Advanced carbon dating like isotropic and Luminescence method to determine the age of objects older than 30000 years.
- Cave probings in the region to establish marks left by travellers and Jain saints of Rushabhdev era.
- Survey the area en-route to Kailash by Jain travellers for evidence left behind.
- Invasive exploration like test pits to dig and find the temple ruins once the site is defined.

One should invite collaboration from the scientific community and governmental agencies to assist in continuing this work further. The scientific community could assist in the archaeological, anthropological and philological methodologies and other possible multi-disciplinary scientific studies that could be conducted for this purpose and subsequently implement a research plan. The involvement of Chinese scientists in the project may help in getting permission. Assistance from international institutions and help from the Chinese and Indian government and other institutions may also be necessary as the project falls in Chinese territory.

The experience dictates that project of this nature may take several years more before any meaningful results may be achieved, therefore we should have adequate financial support to carry out the project. The weather at the project site is hostile, windy, and cold and lacks oxygen and people can work only for couple of months in summer. These factors should be considered in project team selection including advisors /experts. Till then:

- Continue collection of literature on Ashtapad. Continue bringing out further volumes.
- Study literature on Bon Po and Zian, check if some reference is there about Aadinath, Rushabhdev, Ashtapad, Nirgranth- Shraman- Jainism.
- Study information and translate references from Tibetan language (Kanjur Tanjur books, Bon Po books & others).
- Geological, archaeological studies and Satellite.
- Government level coordination- India / China / Nepal / USA and other countries like Swiss / Germany etc.
- Have more meetings/ lectures / seminars and exhibitions on Ashtapad.
- Visit other places like Sikkim, Nepal, Mysore, Dharamshala, Tibet, Uttarkashi.
- Study historical background of that time specially political, religious and cultural during Rushabhdev era.

Shri Rushabhdev era was the dawning of world civilization and once located, it will tell us about early growth of human civilization, religion and culture.

37 A proposal for further research

Rajnikant Shah, Mayur Desai & Ajit Shah

Ashtapad Research International Foundation (ARIF)

Reference : Request for Information, Archaeological and Scientific Research for Ashtapad Palace/Temple, Southwestern Tibet, People's Republic of China

Gentlemen,

Ashtapad Research International Foundation (ARIF), a non-profit organization established in 2008, is seeking information from qualified research institutions for further scientific research to locate historic Ashtapad Palace/Temple that was believed to have been built several thousand years ago and located in the present day southwestern Tibet, People's Republic of China.

This Request for Information ("RFI") will be used to better define the scope of the research project and will be used to generate a Request for Proposal (RFP) to advance the research conducted to date. The research project, as currently envisioned, involves the invitation to a qualified research institution(s) to prepare detailed research proposal, develop financial proposal for grants and participate into a field and office cooperative research collaboration. The qualified research institution(s) will enter into a long-term agreement with the ARIF that will require the institution to participate the research project. If the ARIF decides to progress beyond this RFI to issuing a Request for Proposals ("RFP"), the RFP will be publicly advertised and distributed to qualified interested parties, including those who responded to this RFI.

A project summary developed by ARIF is attached with this RFI for your reference. A small team of scholars and scientists with input from religious scholars performed limited field and office study to develop a framework of the scope of study and to gather preliminary site reconnaissance information. Review of high resolution satellite photographs by space scientists from Indian Space and Research Organization (ISRO), who also were part of our team, suggests a high likelihood of probable site within southwestern part of Tibet in the vicinity of Mt. Kailash.

An informational meeting/seminar with scientists involved in this project was held on January 13, 2009 at L.D. Institute of Indology in Ahmedabad. The scientific team conducted an in-depth discussion of their findings that are also presented in the attached summary document. In addition, topics for future study were discussed. The ARIF requests that interested parties submit a "*Letter of Interest*". The selected institutions will be encouraged to participate in our preliminary information meeting.

We appreciate your interest in this RFI and we are looking forward to working with you on this very exciting project.

Very Truly Yours
Ashtapad Research International Foundation
Dr. R. Shah & Team Members

Vol. Ref. Up Coming Volume

A Proposal for furture research - To Locate Ashtapad Tirth

Prepared By: Ashtapad Research International Foundation

Aerial photo of Kailash area Aerial photo of Kailash area

Lake Mansarovar

Abstract

This report provides a very brief summary of research conducted to date by a group of scholars and scientists under the guidance of Dr. Shah of New York Jain centre, USA, in locating ancient Ashtapad Palace/ Temple and the Ashtapad Mountain described in ancient Jain scriptures. Subsequent to a thorough review of the available literature, satellite maps and interview with Tibetan Monks at several locations, three research expeditions were conducted in June 2006, July 2007 and June 2009. The expedition team consisted of Engineers, Jain scholars, Sanskrit scholars, Geologists, Archaeologist, Space Scientist and a Physician.

Based on the preliminary study, ten probable locations were narrowed down for further study.

This report provides some of the background and summary details of the project. Potential areas of further research are also identified.

1. Introduction

Tibetan plateau in China is the highest and the largest plateau on the planet and it is referred to as 'Roof of the world'. In the southwestern part of the plateau lies Mt. Kailash which is also locally known as Kang Rim Poche. Mt. Kailash is considered sacred by four religions: Hinduism, Jainism, Buddhist and Bon Po. This mountain is considered the throne of the

Gods where the world and the eternal unite and it is considered central to the growth of civilization (Vol VIII/49D/P. 3286-3309).

For centuries, the geologic forces have shaped the Himalaya and the Tibetan Plateau. However, Mt. Kailash has not been affected significantly in spite of the active glaciations and seismic geology of the region. Eastern scriptures describe that the human civilization started much earlier than those supported by scientific evidence. The research project proposed by ARIF would be to understand disconnect between scientific data and eastern scriptures which suggests that the civilization and religion originated in the holy land of Mt. Kailash. The specific focus of this project at present is to investigate the whereabouts of the Ashtapad Temple/Palace. Documented evidences in the scriptures and Indian history suggest that the Ashtapad Temple/Palace was built in the vicinity of Mt. Kailash however, no evidence of it can be found in the present time. ARIF proposes to conduct a scientific study using a multi-disciplinary and coordinated effort to find the ruins or the evidence of historic Ashtapad Temple/Palace location.

2. Begining Of Human Life & Growth of Civilization

In January of 1995 a team of international geologists working on climate shift and solar radiations have hypothesized in a BBC documentary that the human life may have been formed in Tibet (Vol XII / 86A to H/ P. 5467-5583). The finding of Ms. Maureen Raymo of M.I.T at Cambridge, MA appeared in Hong Kong based South China Morning Post sometime in January of 1995. All human life is formed out of the uplift of the Tibetan plateau (Vol IV/21L/P. 1231). In addition, famous geologists Medlikar, Blenford & Lampburse have considered Himalaya to be native place of all human beings. Prof. L.V Holstead of Nigeria also thinks that human civilization may have originated from Himalaya. According to Mr. Parjitar, human civilization started near Kailash. (Vol. XII/85/P. 5428). However, no formal archaeological studies have been conducted to investigate this hypothesis.

3. Archaeological Evidence

Archaeological evidence of the oldest human skull found in Africa suggests that the modern man first evolved in Africa. Further from Paleolithic sites there is evidence that Paleolithic man lived in Tibet, India and elsewhere 30000 years ago. Many such sites have been found in southern and western Tibet.

During the Last Glacial Maximum (LGM) when continents were connected by ice, about 20,000 years ago, there is evidence of large scale migration of humans all over the Earth. The man from Africa migrated to many regions of the earth. There is genetic evidence based on DNA/ genome matching that substantiates that Paleolithic population existed in many places. For example, they lived in Europe (as far as Greenland) and southern India also have an ancestral descendancy from the African Man.

Archaeological sites of Paleolithic (roughly 100000 to 30000 years) and Neolithic (~7000 years) culture exist in Tibet, particularly in south Tibet, near Mt. Kailash. Recently human hand and foot prints have been found in hot spring travertines at an elevation of 4200 meters. Some foot prints are larger than those expected of the present day inhabitants. The age of these foot prints is estimated at about 20,000 years old.

The following points may be relevant

i. The oldest evidence of man in Tibet is dated about 30,000 years

ii. A second phase of human occupation occurred during the Neolithic period (early and middle Holocene)

iii. Mid Holocene conditions provided evidence for enlargement of areas favorable for grazing.

iv. There is evidence that early hunters used the Tibet area during the warmer and wetter Holocene period.

4. Climatic Evidence

Climatic data of Tibet is available for the past 40,000 years. The data consists of environmental temperature based on oxygen-18 method from ice cores, thickness of ice sheet in Tibet and inferred lake levels etc. For western Tibet detailed climate record are available for the past 13000 years. From these studies, it is possible that

i. Higher lake levels existed between 40000 and 30000 years. It is likely that the first appearance of prehistoric man coincided with periods of high lake levels.

ii. The data show three periods of high temperature, the most recent warm period had an onset about 12000 years ago.

iii. Ice cores from Tibet studied by Dr. S. K. Gupta at Physical Research Laboratory by Oxygen-18 method show three relatively warm periods i) 32-36 thousand years, ii) 24 to 28 thousand years, and 12000 years to present. The intervening periods were very cold and ice thickness on Tibetan Plateau was significantly large. The cold and harsh climatic condition may have put constraints on development of civilization.

iv. The deeply incised glacial basins around the Kailash are the outcome of the prolonged glacial action. There are direct evidences of extensive glaciations in the region in the form of lateral moraines suggesting that the glaciers were more extensive compared to the present.

v. Once the glacial climate initiated in the Kailash area, various Glycogenic features such as Arete, Horn, Truncated Spurs, Table land topography, Grooves and Protrusions (Differential Erosion) were developed. These features were mistaken for human sculptured features.

vi. Study of vegetation may also help.

5. Agriculture and Lord Rushabhdev

During the early period of human civilization, man was completely dependent on nature for all his needs. The nature (trees and forests) provided almost all that the man needed at that point of time. Jain scripture and mythology, KALP VRUKSHA (Tree) describes this phenomenon. Jain scriptures further describes that Rushabhdev taught ASI, MASI & KRISI, i.e., defense, art and agriculture (Vol IV/23E/P1491-1496). This leads us to believe that Rushabhdev swami's reign must predate the first evidence of cultivation.

In the early civilizations, people lived near banks of river for water. With the passage of time as civilizations matured, people migrated along the river routes as demonstrated by Harappa and Mohan-Jo- Daro excavations along Sindhu river valley which proves the above hypothesis. This

civilization is estimated to be approximately 7000 years old BC. (Vol IV/21F/P.1193-1201). The pre-history of Indian sub continent began at Mehrgarh in Baluchistan in about 7000 BC with the transition from hunting, food gathering and nomadic to agriculture, animal husbandry and village life.

To date, the rice and wheat dated in India were showing clustering of ages around 4000 to 5000 years before present. Recently however dating of coal found with rice at Lahurdewa, in Sant Kabir District, (U.P) has given an age of 10,200 years to 11,200 years. These samples were collected by Prof. I.B. Singh of Lucknow University and Rakesh Tiwari of State Archaeology Department and dated by M.G. Yadav at Physical Research Laboratory, Ahmedabad using the Carbon-14 dating method. It is possible that even older sites will be found but this age of 11000 years gives the nearest limit to Rushabhdevji's period.

There are natural caves at around 5900 m in Kailash and abandoned settlements on a curvilinear ridge above Gyangdrag Gompa. The former looks recent whereas the latter goes back to the historical period. A formal statement on this can be made once these structures are investigated by the geo-archaeologist preferably having expertise on mountain archaeology.

6. Non Violence and Lord Mahavir

Mahatma Gandhi of India and Dr. Martin Luther King of USA showed us the non-violent way of peaceful demonstrations in 20th century. The principle of non violence has a great significance in the present war-torn world.

This principle was originally taught 2600 years ago by Lord Mahavir (known as PHELWA in Tibetan language), the 24th Tirthankar in Jain religion. He preached "Live and let Live". Ahimsa (Non - violence) was an important component of Mahavir's philosophy of life. This ideal of Ahimsa was realized by Mohandas Gandhi and Dr. Martin Luther King.

Jainism is another stream of spiritual renaissance which seeks to refine and sublimate man's conduct and emphasizes Ahimsa, non-violence as the means to achieve it (Vol X/67 D to J/P.4364-4407)

Jainism (GYAL PHAL PA & CHEAR PU PA) is the one of the oldest living religion of the world (Vol XII/85/P.5400-5465 & Vol XI/76A/P.4807-4827). It should be noted that according to Jain tradition Rushabhdev (Called KHYU CHOK) was the first among the 24 Tirthankar's and Mahavir was the last (Vol III/15C/P.990-1002).

7. Ashtapad Temple / Palace

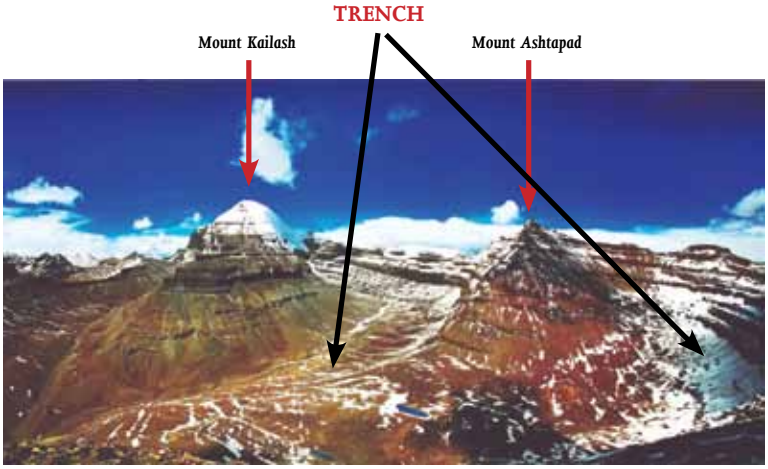
This brings us to the origin of civilization as mentioned in our introductory paragraphs. According to Jain scriptures, Rushabhdev taught principles of defense, art and agriculture to the society. After establishing his kingdom and teaching the people about civilization, Rushabhdev became a Monk, did penance at Ashtapad mountain in Kailash Tibet area and attained salvation there (Vol VIII/52H/P.3657-3671). His son King Bharat (PHOO) constructed a Temple / palace (SANGYE SHHUK THI, YEN LAK GEDEN NA GYAD DEN, EIGHT THRONE, and ASHTAPAD TEMPLE) with gems stones (Vol X/67B/P4352-4354) on Ashtapad Mountain as a memorial to commemorate the "Nirvan of Rushabhdev". The temple was Omni directional which means

four sided (Vol IV/23D/1488-1490). According to scriptures, this temple was a major Jain Tirth (a pilgrimage place) and was described to be situated in the tranquil heights of the snow covered Mt. Kailash region. The name Ashtapad is derived from the fact that there are eight (Ashta) Steps (Pad) leading to the Palace/Temple. The Literature further describes that the descendants of Rushabhdev also made a trench around Ashtapad to protect it. At present, the exact location of Ashtapad is not known.

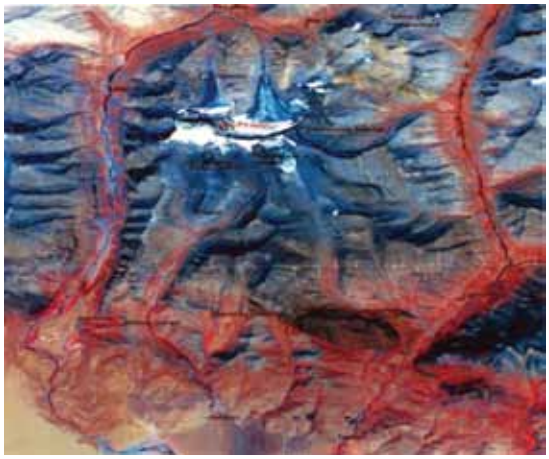
The scriptures further describes that about 2600 years ago, Gautam Swami - main disciple of Lord Mahavir - climbed, stayed overnight & worshipped at Ashtapad Mountain. If Ashtapad temple existed at that time, then the questions that need to be investigated are what happened to it during the subsequent period? How did it disappear? Could it have been destroyed either by forces of nature or by someone else or was it buried due to geological processes?

8. Mount Kailash

Mt. Kailash is an amazingly symmetrical striated pyramid at 22800 feet height. At about 36 kilometers to the south of Mt. Kailash lies Lake Mansarovar. Four great rivers of southeast Asia emanate from this lake. They are Sindhu (Indus), Brahmaputra (Tsangpo), Sutlej and Karnali (Vol IV/21C/P. 1152-1173 & Vol III/13G/P. 838-858 & Vol X/68A to I/P. 4425-4473). The various literature collected on fourteen CD's by ARIF includes very interesting photographs of the Mt. Kailash – Mansarovar region (Vol XIV/110 F to I/ P. 6348-6562 & Vol XI/81/P. 5077-5265). Maps published by Karto Atelier and photographs of Mt. Kailash area are put together on one of the DVDs.



Poster Picture Commercially Available



Satellite Picture of Kailash Area

9. Literature on Ashtapad

Much literature of interest has been collected from old scriptures and put together in 18 volumes in approximately 8000 pages with reference to Ashtapad and other related subjects. Research work conducted by ARIF and information on other topics such as civilization, geology, archaeology, field trips, maps and photographs etc. are also compiled in the DVD. From this literature one learns a lot about Ashtapad. Study of literature may aid in determining the age of Aadinath as described in scripture. This information may help estimate the time frame of

Ashtapad in terms of scientific age. All volumes (I to XVIII) are presented in 2 DVDs with index. All research material is presented as a separate DVD also. An index booklet to these volumes has also been prepared for ready reference.

10. Bon-Po (Tibet's Indigenous Religion)

In this area of western Tibet and around Himalayan border land, original indigenous religion (spiritual & cultural tradition) was called Bon Po which is supposed to be approximately 8000 years old or more and was contemporary with the Jain religion at that time. MOINBA people numbering around 100 thousand practiced BON religion. Many of the principles of the Bon Po are similar to Jain principles. Bon Po has specialized Shaman priests and Jain religion leaders were also called Shraman (Vol X/72/ P. 4609-4688).

Bon Po has influenced the religious and cultural developments of numerous people in Central Asia. Until about 7th to 8th century Bon Po was a predominant religious culture, over the extremely wide area of Central Asia. It represents the indigenous source of Tibetan culture.

Records of early history of Tibet and Han dynasty and the relationship between SHANG people and JIANS is interesting to note. Around 1400 BC there was a Semi Tibetan people called "JIAN" mixed with SHANG people. Tibetan people may be the descendent of "JIAN" also called JIAN Tibetan people. JIAN may be a synonym of JIN (Tirthankar), which means conqueror. (Vol. X/69 A to F/P. 4475-4493).

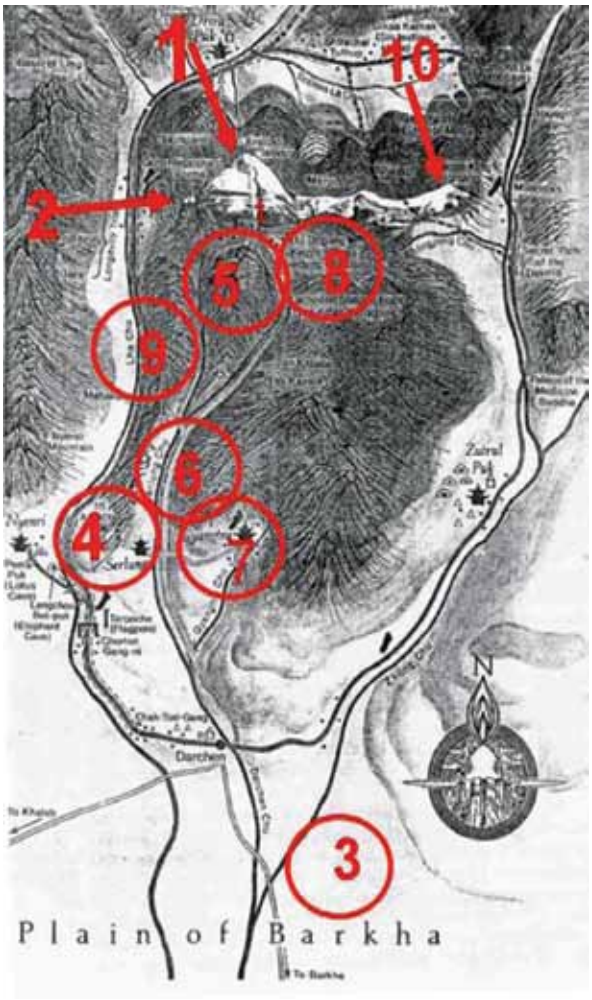
Proposed Research Plan

Vis a Vis World Scenario

Preliminary research has been done regarding the authenticity of Rushabhdev and Mt. Ashtapad, both by eminent scholars and scientists from India and abroad. Teams of scientists and research scholars from various fields have also visited this area of Mt. Kailash during the summer of 2006 and 2007 for preliminary reconnaissance survey (Vol XIII/98/P. 5961-5963 & Vol XI/ 80 A to E/ P. 4963-5005). The result of field observations and subsequent studies have been incorporated in these volumes and presented in a (geology) DVD format also (Vol X/71 A to L/ P. 4521-4608). In addition to the field trips, satellite data has also been critically studied to locate any possible sign of a buried structure in Mt. Kailash region. The satellite data includes the images of IRS LISS- IV which was combined with the map of Mt. Kailash region (1:50000 scale), Published by Karto Atelier of Switzerland. The images of IKONOS and IRS satellite using Arc info software have also been critically studied to locate any possible buried structures in the Kailash area. Dr. Thakker of the Indian Space Research Organization has prepared a site map of Mt. Ashtapad including Dharma King Norsang and has identified a probable site of Ashtapad which is located at southeast of Mt. Kailash (6638 m) at the altitude of 5996 m. The contours at the top of the mountains show relatively flat area to the southeast. Further field investigation is warranted to confirm this hypothesis. It should be noted that archaeological sites at the high altitude such as this are also found in other parts of the world (e.g., volcano Llullaiaco, Argentina at 21000'). Geological analysis of the satellite data may indicate a rock structure that can support any construction and the possible location of Ashtapad Maha Tirth in Kailash Region. (Vol XI page 4958). Few probable sites of Ashtapad (Latitude: 31.066667 N & Longitude: 81.3125 E) have been identified. Efforts are being made to get high resolution data of this area for further reconfirmation of our studies (Vol XII/93/P. 5682-5708).

Probable sites for Ashtäpad

(1) Mount Kailash, (2) Bonari near Kailash, (3) Barkha plains, (4) Tarboche, (5) Nandi Parvat, (6) Mountain between Serlung Gompa and Gyandrag Monastery, (7) Gyandrag Monastery, (8) 13 Drigung Kagyu Chorten, (9) Probable site of Ashtapad known as Gombo Phang or Trinetra or Mahakal, (10) The site was detected using satellite data by P .S. Thakker and known as Dharma King Norsang.



A research based on surface geological, archaeological and geographical studies conducted by East Asia Center at University of Virginia in northern Tibet has brought to light the forgotten. It is published in Athena review volume 3, 204 (Vol XV/115C/ P to be published). This may guide us further for archaeological studies.

The proposed research plan is similar to the one being undertaken by university of California to locate tomb of Genghis Khan. Using advance visualization and analytical technologies and conducting a non- invasive archaeological analysis. They are using spectral and digital imaging, remote sensing techniques and satellite imagery to take digital pictures and then display on million pixels high resolution display wall. Further they will use ground penetrating radar, electromagnetic induction and magnetometer to conduct non destructive and non- invasive surveys. Their electrical engineering department will then develop visual algorithms to create a 3-D representation of the site. They are hoping to collaborate with the Mongolian government and its national universities.

a. Identification of the probable site location from ethno historical literary sources in conjunction with local knowledge.

b. Identification of probable buried Ashtapad Temple / Palace ruins from satellite photographs primarily from the visible light spectrum and also non visible light spectrum. A non visible light spectrum which has been successfully used by Dr. Bloom of NASA Jet Propulsion Laboratory and others.

c. We shall try to obtain Aerial photographs of these areas of interest and study. The Google earth professional version / Google advance software etc may offer a better clarity. The review of this material may show signs of any cultural (civilization) features (Vol XI page 4960-61).

d. Non – destructive geophysical exploration survey by various integrated techniques after the probable site is identified with higher degree of certainty.

e. More invasive archaeological exploration such as test pit excavation at the most probable and anomalous sites identified from geophysical survey techniques using radio imaging, electromagnetic induction and magnetometer etc.

f. Carbon dating of samples uncovered from archaeological test pit excavation.

As per Jain scripture the age of Rushabhdev would be hundreds of thousands of years ago. Age frame for Ashtapad cannot be correlated with reference to scientific data available at present. One may go back to 10,000 to 20,000 years or even more as more and more scientific studies become available.

From the above discussion, it appears that most promising period to look for evidence for Ashtapad will be when Gautama Swami visited Ashtapad 2600 years ago. Rushabhdevji's stay and Bharat's construction of temple in Mt Kailash area could be between 11,000 and 20,000 years or further back. In view of this the future research should be aimed at the following.

1. We should reconstruct the past climatic history spanning last 20,000 years around Kailash. Towards this, sediment core from Mansarovar lake would be most ideal material to work on. A core of say 5-10 m may go back in time to 20,000 years. A core from Mansarovar will be a treasure sample for local and global climate, Himalayan erosion and orogeny, cultural, social and archaeological aspects and even from geological (geomagnetism, biological changes etc.) point of view. The core has to be first dated and then can be subjected to magnetic, mineralogy, pollen, and stable isotope, major and minor elements. These proxies provide information about the past climate variability.

In this context, more recently, an effort by Juyal et al (2009) has been carried out by reconstructing the summer monsoon variability using Proglacial lake sediments at Goting in the Higher Central Himalaya very close to Lake Mansarovar. The sediments were analyzed to reconstruct the summer monsoon variability during the Last Glacial to early Holocene. Sedimentary structures, high resolution mineral magnetic and geochemical data suggest that the lacustrine environment experienced fluctuating monsoonal conditions. Optically stimulated luminescence (OSL) dating indicates that the lake sedimentation occurred before 25 ka and continued after 13 ka. During this period, Goting basin witnessed moderate to strengthened monsoon conditions around 25 ka, 23.5 ka–22.5 ka, 22 ka–18 ka, 17 ka–16.5 ka and after14.5–13 ka. The Last Glacial phase ended with the deposition of outwash gravel dated at ~11 ka indicating glacial retreat and the onset of Holocene condition. Additionally, centennial scale fluctuations between 16.5 ka and 12.7 ka in the magnetic and geochemical data are seen.

A close correspondence at the millennial scale between their data and that of continental and marine records from the Indian sub-continent suggests that Goting basin responded to periods of strengthened monsoon during the Last Glacial to early Holocene. Juyal et al., (2009) attribute the millennial scale monsoon variability to climatic instability in higher northern latitudes. However, centennial scale abrupt changes are attributed to the result of albedo changes on the Himalaya and Tibetan plateau Based on the variation of the proxy indices in general and FeO, Al_2O_3 and TiO_2 in particular of Juyal et al., (2009) and Vostok ice core sediments analysis, and geological evolution of Himalaya mountains and evolution of human life in this region as well as analysis of biographical details of Rushabhdev in Jain scriptures Jain et al. (2009) concluded that most likely era of Lord Rushabhdev might be between 16.5 and 21.5 ky.

2. The Ashtapad temple might have buried in few thousands of years as a function of climatic variation since its construction by King Bharat. Therefore, we should explore the potential sites in depth, however, without excavating using modern techniques. Jain et al (2009) recommend to use Radio waves and Microwave Remote Sensing techniques for getting information about the buried objects. The current techniques such as Ground Penetrating radars (GPRs) and mini-Synthetic Aperture Radar (mini-SAR) mounted on the satellite may be used to look deeper into the potential sites.

The Microwave frequencies have unique properties that include day and night capability, all weather capability, penetration through snow and soil, and determination of water content in the soil as well as in snow and any other target material. Regarding depth of penetration in case of dry snow and dry soil for a given frequency penetration is maximum. However, the depth of penetration also depends upon the frequency and for lower frequency the penetration depth is larger relative to higher frequency. This also depends upon penetration angle as well as polarization and type of surface. It has been reported that for dry soil at 3.0 GHz it can penetrate upto 30 meter and so for 1.4 GHz frequency we expect better that 30 meters and if we choose further lower frequency like 500 MHz we expect that penetration depth could be 40 to 50 meters. However, the resolution becomes poor with lowering the frequency.

In case of dry snow, it is transparent upto 9 to 10 GHz, this means that for completely dry snow for frequencies below 9 GHz it can look at the bottom of Snow which means it can look at rock or soil below dry snow. If snow is wet than it will look at some point in the ice sheet layer.

In microwaves we have two types of sensors. The passive sensor receives the self emission of the target. This self emission is the function of the dielectric constant of the material, surface roughness, and density of the material. It also depends upon the look angle, polarization and operating frequency. On the other hand, in case of active sensor like Radar the microwave energy is incident on the target and the reflected/ scattered energy is received. The Scattering Coefficient is the measurer of the physical and electrical properties of target and of the sensor parameters just as in case of emission.

Now using these techniques we can locate buried objects. In case of remnants of the temple in Kailash-Mansarovar area we have to first make a survey of the potential sites and then locate the remnants. However, for locating buried objects in snow/ land microwave techniques are better. Here we can use satellite data and airborne data. An approach in this direction may be undertaken through space agencies of India and China to consider special mini-SAR on one of the low earth orbiting satellite to provide high resolution images of the Mt. Kailash Mansarovar tropical region.

In parallel we should consider the application of ground based measurements employing GPR particularly for the identified potential sites. We assume that the terrain at most of the potential sites is flat and not sloppy and therefore, in this case, we can use the ground base techniques along with airborne and space borne surveys. On ground we can use Radiometers, Scatterometers and Ground Penetration Radar (GPR). We suggest that as per the data available about the location we can undertake surveys, conduct ground based studies supported by Air borne and space borne system.

The formation of a mountain range takes place as a consequence of topography creation by tectonics motion (or volcanism) and relief creation (deep valleys and sharp peaks) by water and erosion. The life of mountain series is generally around tens of million years and it depends upon process occurring between erosion and gravitational forcing. The maximum elevation of the mountain depends upon equilibrium between driving and resisting forces described by Argand number. In theory, the height of the topography will increase with the viscosity or the horizontal convergence. Once topography has formed, erosion acts to create relief. Based on present topography (Altiplano, Tibet), we could assume that for present time the maximum sustainable elevation is around 5 km. However, implication for the landscape response to increasing uplift for denudation rates < ~0.5 mm/yr, the channel gradient is relatively insensitive to erosion rate and most of the relief is hold by hill slopes. In the case of denudation rates > ~0.5 mm/yr the hill slope angle is constant, and increasing relief with increasing erosion rate is hold by the river gradient increase along the whole fluvial network. This suggests that against erosion or volcanic activity Ashtapad temple would have moved inside at the rate of 0.5mm/yr (minimum), and considering 10-20 thousand years period we may estimate the current depth of about ~5-10 meters. But the further down shift due to additional gravitational force cannot be ignored and therefore preliminary we may consider exploration depth between 1-50 meters. This can be achieved by multi-frequency GPR. We propose to select 4-5 frequencies between 500 MHz and 5 GHz. Though resolution depends on frequency, polarization, incidence angle and structure of the soil etc but we propose to achieve 1-meter spatial resolution, and therefore succeeding in locating some structures such as stones, statues, pillars, trenches etc of this resolution may lead us for further detailed investigation.

3. As a working hypothesis, it can be assumed that till the emergence of civilized society in the western Tibet, people were largely hunter and gatherer for example from Paleolithic (~100000 year) to Neolithic (~7000 years). During this period there would be minimum anthropogenic disturbances and hence the sediment flux into the Mansarovar Lake would be essentially from natural process (climate). Once the evolved civilization began to inhabit the area around Kailash and Mansarovar, people would have domesticated plants and animals, along with pursuing agricultural activity. The nature of sedimentation would now be modulated by a combination of natural and anthropogenic processes. This can be ascertained by changing rate of sedimentation, emergence of domesticated plant pollen species and soil dominated magnetic mineralogy.

1. We understand Mansarovar Lake was much larger in expanse in the past. It has not been explored for detailed climate and civilization studies so far. We recommend that we dig shallow pits in the marshy areas around the Mansarovar and study the sediments for the proxies discussed above.

2. We are hopeful that climate and archaeological investigation around the Mansarovar Lake will provide an insight for evidence of Rushabhdevji's and King Bharat.

Summary- Conclusion

The brief background presented in this introductory document presents the preliminary efforts by ARIF to investigate probable location of ancient Ashtapad Palace Temple. Although the

historic literature, Jain scriptures and folklores suggest that Ashtapad was built in the Mt. Kailash-Mansarovar area of Tibet (Vol II/9 D/ P. 480-494), at present this temple is not traceable. Literature search, interview of Buddhist lamas in Tibet and preliminary aerial satellite survey have been made to explore this fact. Intention of ARIF is to try to rediscover the location and remains of Ashtapad and present the data to the public at large, so that one can go and worship there (Vol V/33B/P2165-2170). ARIF would request input from the scientific community in using archaeological, anthropological and philological methodologies and other possible multi disciplinary scientific studies that could be conducted for this purpose and subsequently implement a research plan. The probable can be visited by team of scientists, archaeologists, geologists and other experts to examine the probable sites and discern a most probable location on the basis of process of elimination. The research also should include studies about Bon Po religion. Assistance from international institution & help from Chinese, Indian and other overseas institutions may also be necessary. Discovery of the archaeological site may also be helpful in shedding light on hypothesis that civilization might have commenced from Tibet and contribution of Rushabhdev who taught ASI, MASI, and KRISI to human beings as suggested by Jain scriptures.

It should be noted that the sentiments of the Jain community all over the world are deeply associated with the Holy Tirth of Ashtapad (Vol IV/ 28 A & B/ P. 1709-1815 & Vol V/ 32 A & B/ P. 1991-2156). An attempt is being made to reconstruct a model of this Ashtapad Tirth out of gemstones as per the description from the scriptures, so that people can visit and worship till the original one is discovered. (Vol VII/ 45 J / P. 3074-3156 & Vol XIII/ 100/ P. 6062-6093). Photographs of these models are presented below.

A Model of Ashtapad carved from Serpentine Stone

A Model of Ashtapad carved from Crystal

Literature available on request

The following literature collected by ARIF to date is available upon a written request. The institutions invited for the RFP will also receive a copy of this literature.

1. Geological Reports and KM Photos, Power Point – 1 DVD
2. Ashtapad Literature Volumes I to XX – 2 DVDs
3. Ratna Mandir / Kailash Mansarovar / Satellite Images – 1 DVD
4. Ashtapad Granth I & II - Online

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- Jain Rajmal, Juyal Navin, Shah Jitendra and Shah Rajnikant, 2009, Presentation on "New Techniques to Explore Ashtapad Temple" on 29 November 2009, Ahmedabad, India.

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Refer to Volume I to XX.
See Volume XIII, Chapter 56, Article A / B / C, Page # 3805 – 3814.
See Volume IX, Chapter 65, References, Page # 4324 – 4330.
For Subject Cross References See Volume XX Chapter 157 Page # 8890 – 9000.

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Chapter - 10

Selected Index with Cross Reference
Volume I - XX

• Flora and Fauna observed during the trip	Photo Gallery
• Explanation of Codes used in Index	-
• Selected articles with Cross Reference from Vol. I - XX	-
• Author's Index with Codes	-
• **Timeline**	Folded chart

Introduction

A selected index with cross reference from volumes I to XX is included. These are original articles collected during a ten year period and presented in XX volumes. They represent research related material. We have given a list of selected articles as per our code F (Geology), H (History), K (Kailash), U (Research) and Z (Maps and Photos). A selection from these articles makes up Ashtapad Granth Part II. All these material is provided in a DVD format including Granth I and II with this Granth. This is followed by authors' list.

Photos of Flora and Fauna observed during the trip are given here.

A folded chart, giving all the details in chronological order, has been included here. This includes Tibetan and Indian history. It also includes Geology and Climate details. The history of Jainism is provided in detail. The chart is divided in columns into related topics which are presented in different colors.

Flora and Fauna observed during the trip

Marmot

Sparse plant life in Mount Kailash region

Raj Hans

Sheep in the valley

Musk Deer (Kasturi Mrug)

Yaks

Yaks

Expedition's yaks in Lha Chu river valley

Flora and Fauna observed during the trip

Flora and Fauna observed during the trip

Flora and Fauna observed during the trip

Only grass and small plants grows in Kailash area (no trees)

Introduction for Index

We have been collecting a lot of literature from the scriptures and books related to Ashtapad. We have also been collecting all the research related material including geology and Kailash. Literature on Tirthankar, Nav-Graha and other Ashtapad Tirths have also been put together. Making of Ashtapad Tirth, model making and details about gemstones have also been added. Many exhibits and seminars were held. Those details including visitors' books have been included. Many photos of various ceremonies and maps from the research tour have been added into these volumes.

A cross reference has been added to the original index of all the articles, chapters and volumes. Then all these material have been coded and each subject or topic has been given a special code letter. The codes given are arranged in an alphabetical order from A to Z. These codes have been further subdivided into sub codes as per specific topics, which is included in the code index. It has the language of the articles and page numbers also. This code index has been given in the beginning of this chapter. This has made the presentation of all the material in a more classified and easier manner and easy to look for any specific subject, article and authors.

Further to make the material collected (9000 pages) more interesting and useful, we have selected few important articles and given them a color shade. We have not printed the master index of all volumes here in the granth, only a list of selected articles with cross reference along with codes in this chapter to make it easier to refer.

Now the master index with cross reference and code index is given in volume XX, chapter 157. To make it more user-friendly this has also been included in a DVD where one can go and filter out article of their choice on any subject.

We have also given a list of authors whose articles have been included in this collection of XX volumes. Each author has been given a specific numerical code to make it easier to identify their articles from all xx volumes.

After chapter VIII we have given a list of books from which all this material has been collected and put together in XX volumes. Some of these granths are also available on www.jainaelibrary.com which reader can refer to.

Explanation of Codes used in Index

A		**ASHTAPAD LITERATURE**
	AA	Analytical Articles
	AG	General
	AS	Articles from Scriptures
B		**BHARAT**
	BB	Bharat & Bahubali
	BC	Bharat Chakravarti
	BR	Bharat & Rushabhdev
	BS	Sinha Nishadhya Prasad
C		**COLORED GEM STONES**
	CC	Colored Stones description
	CE	Energy Field
	CG	Gem Stones + Graha
	CM	Medicines and Science
	CN	Names
	CP	Paintings
	CS	Scripture
	CZ	Stones & Zodiac Signs
D		**ADDRESSES/Dictionary**
	DA	Address of Acharyas
	DI	Indologist and resource persons
	DJ	Jain scholars
	DO	Others
	DR	Dictionary
	DS	Address of Scholars
E		**EXHIBITIONS & SEMINARS**
	EA	Year 2005 - Ahmedabad-Palitana
	EB	Year-2007- Jito-Mumbai
	EC	Year-2008 - Jito-Mumbai
	ED	Year 2005 - Delhi - Kolkata - Jaipur
	EE	Year 2009- Adhar Abhishek Mumbai
	EI	International Seminars
	EJ	Year 2007 - Jaina Exibit - NJ
	EL	Year 2007 - L.A. Temple
	EM	Year 2003 - Mumbai
	EN	Seminar Ahmedabad - 2009
	EP	Seminar Ahmedabad - 2005
	ER	Seminar Mumbai - 2009
	ES	Year 2004 - Surat
F		**GEOLOGY**
	FA	Anatomy of Himalayas
	FE	Earthquake in Himalayas
	FG	Geology & geography
	FH	Geology of Himalays
	FI	Geology of glaciers
	FP	Geological picture plates/maps
G		**GAUTAM SWAMI**
	GA	Gautam Swami & Ashtapad
	GG	General
	GT	Gautam Swami & Tapas

H		**HISTORY**
	HB	Bon Po
	HG	Buddhism
	HH	Hinduism
	HJ	Jainism
	HK	Kailash
	HS	Jainism & Science
	HT	Tibetan History
I		**INDEX**
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Reflections

I am very happy to see the Granth-I.

It has come out very well. The information it contains, the illustrations, photographs, and the layout, all make it a valuable book. Thanks for giving me a copy.

I am sure, it will make a base line document for further research and I want to compliment you for bringing it out.

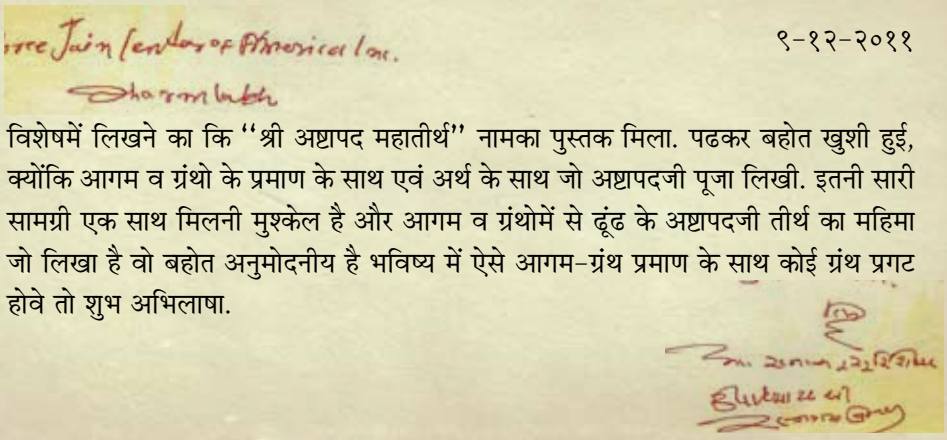
Best Regards

– **Narendra Bhandari**

This is an excellent piece of work nicely edited and containing wealth of information for interesting readers including 2 DVDS and a silver page bookmark. I can very well realize and congratulate for the hard work, patience and strong determination and belief required of Dr. Shah and his co-staff / supporters in carrying out this great and noble project. It would take me sometime to grasp the info which is compiled in Hindi, Gujarati and English. Hope Granth part-II should be finalized by now and ready to go to press. Thanks again.

Regards to both of you

– **Sajjan Jain**



९-१२-२०११

विशेषमें लिखने का कि "श्री अष्टापद महातीर्थ" नामका पुस्तक मिला. पढकर बहोत खुशी हुई, क्योंकि आगम व ग्रंथो के प्रमाण के साथ एवं अर्थ के साथ जो अष्टापदजी पूजा लिखी. इतनी सारी सामग्री एक साथ मिलनी मुश्केल है और आगम व ग्रंथोमें से ढूंढ के अष्टापदजी तीर्थ का महिमा जो लिखा है वो बहोत अनुमोदनीय है भविष्य में ऐसे आगम-ग्रंथ प्रमाण के साथ कोई ग्रंथ प्रगट होवे तो शुभ अभिलाषा.

સાદર ધર્મલાભ

દેવ ગુરુની કૃપાથી શાતામાં છું.

વિ. ખાસ જણાવવાનું કે તમારા તરફથી સંપાદિત અને જૈન સેન્ટર ઑફ અમેરિકાથી પ્રકાશિત શ્રી અષ્ટાપદ મહાતીર્થ ગ્રંથ ભાગ-૧ મલ્યો.

ઘણા જ આભાર સહ આનંદ તમારી મહેનત ખૂબ જ કાબિલે દાદ માગે તેવી છે. ઘણી બધી માહિતી સભર ગ્રંથ છે. શાસ્ત્રીય વર્ણન વાંચતા આંખ સામે સાક્ષાત્ અનુભૂતિનો અનુભવ થાય છે. વર્તમાનના પ્રચાર યુગમાં આવું સંપાદન ખૂબ જ જરૂરી છે. જે તારક એવા શ્રી જૈન ધર્મની પ્રાચીનતાને જણાવવાનું છે.

તમારા આ પ્રશસ્વ કોટિના પ્રયાસની ભૂરિ ભૂરિ અનુમોદના.

યુગાદિદેવની નિર્વાણભૂમિથી પ્રસિદ્ધ બનેલ આ અષ્ટાપદતીર્થનું વર્ણન તમોને ખૂબ ખૂબ નિર્જરા કરાવી તમારા આત્માને પણ વહેલામાં વહેલું નિર્વાણ પામવાનું સુંદર સૌભાગ્ય મળે તે જ એક હૈયાની મંગલકામનાં.

દ. પરમશાસનપ્રભાવક
સ્વ. પ. પૂ. આ. શ્રી વિજય રામચન્દ્ર સૂ. મ. સા. ના
શિષ્યરત્ન મુ. પ્રશાની દર્શન વિ. ના
સાદર ધર્મલાભ

'Lost' tirth of Jains traced to snow-clad Himalayas

Ashtapad Maha Tirth, one of the 5 major Tirths in Jainism, is in the Himalayas, Says book by Dr. Rajnikant Shah

Jain devotees will now get a chance to know and learn about one of the five major Tirths in Jainism, 'Ashtapad Maha Tirth' which is believed to have been lost and is supposed to be situated in the snow-clad Himalayas. The Book, 'Ashtapad Maha Tirth', seems to be well researched book.

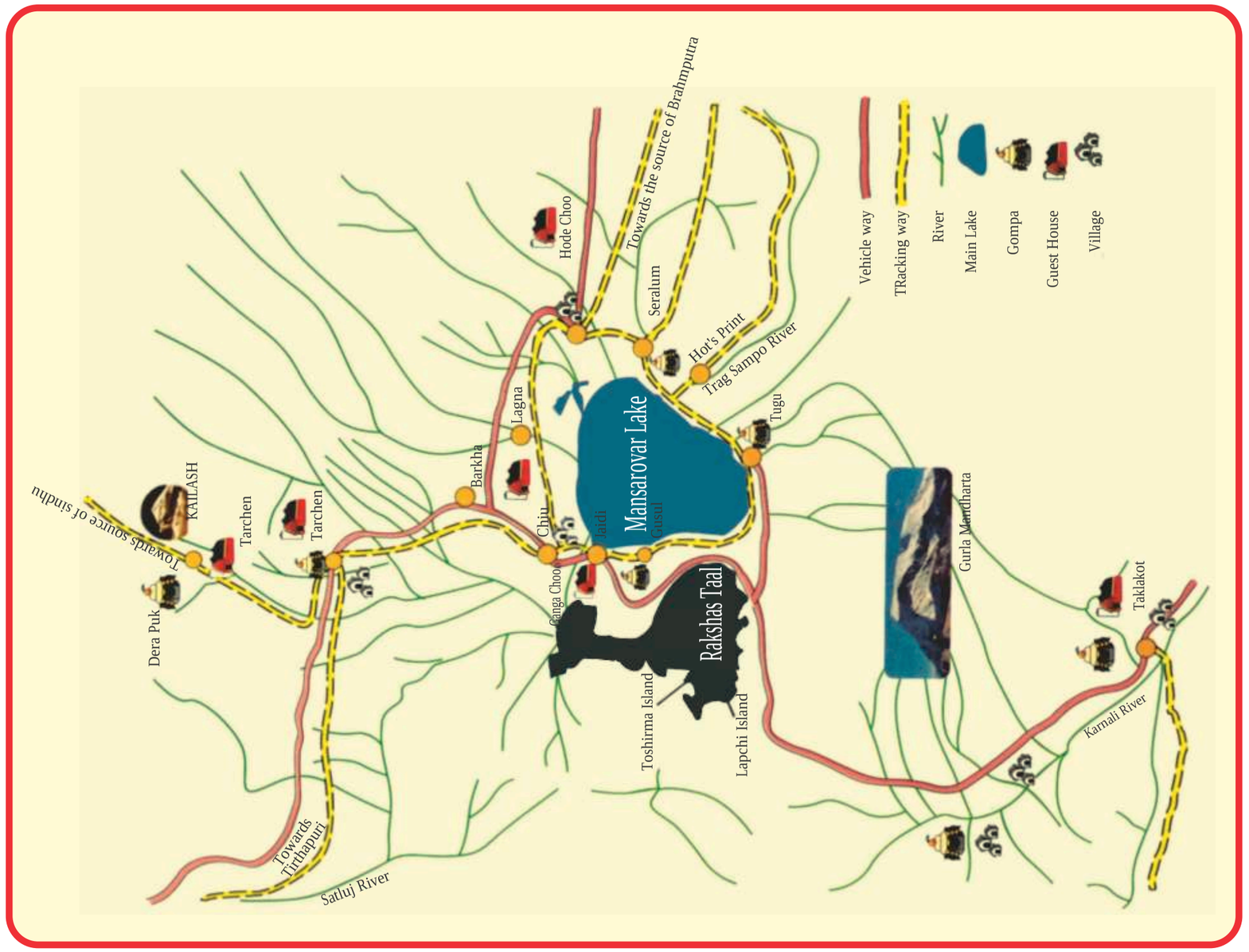
The book's editor Dr. Rajnikant Shah has aimed at creating a much larger Tirth in India.

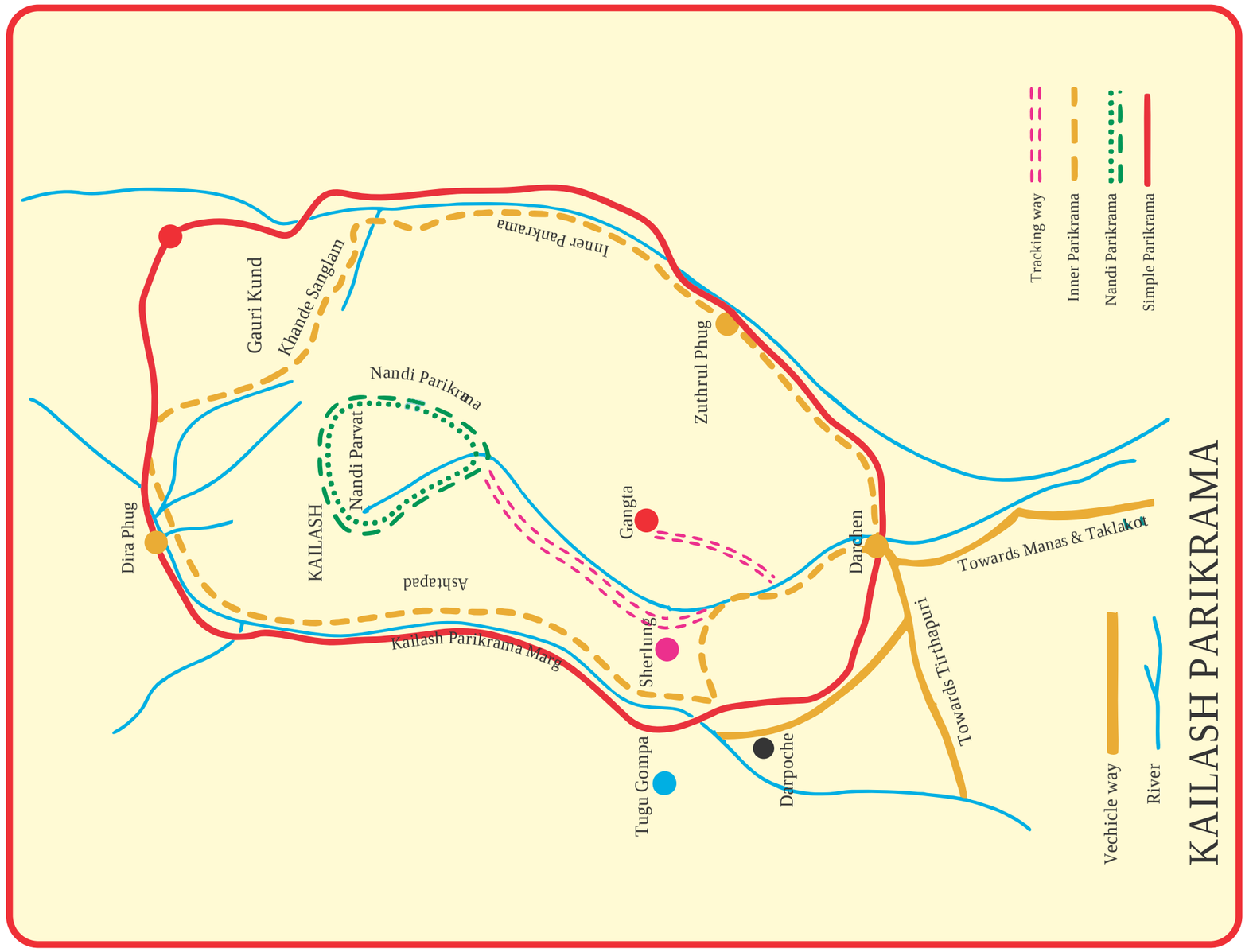
There are many stories related to Ashtapad Maha Tirth like Nag Kumar and Sagar's Sons, Tapas Kheer Parna, Ravan and Mandodari Bhakti, among many others. But as per Jain scriptures, the first Tirthankar, Bhagwan Rushabhdev, had attained nirvana on the Ashtapad Mountain. The son of Bhagwan Rushabhdev, Chakravarti Bharat, had built a palace adorned with gems on the Ashtapad Mountain located in the serene Himalayas.

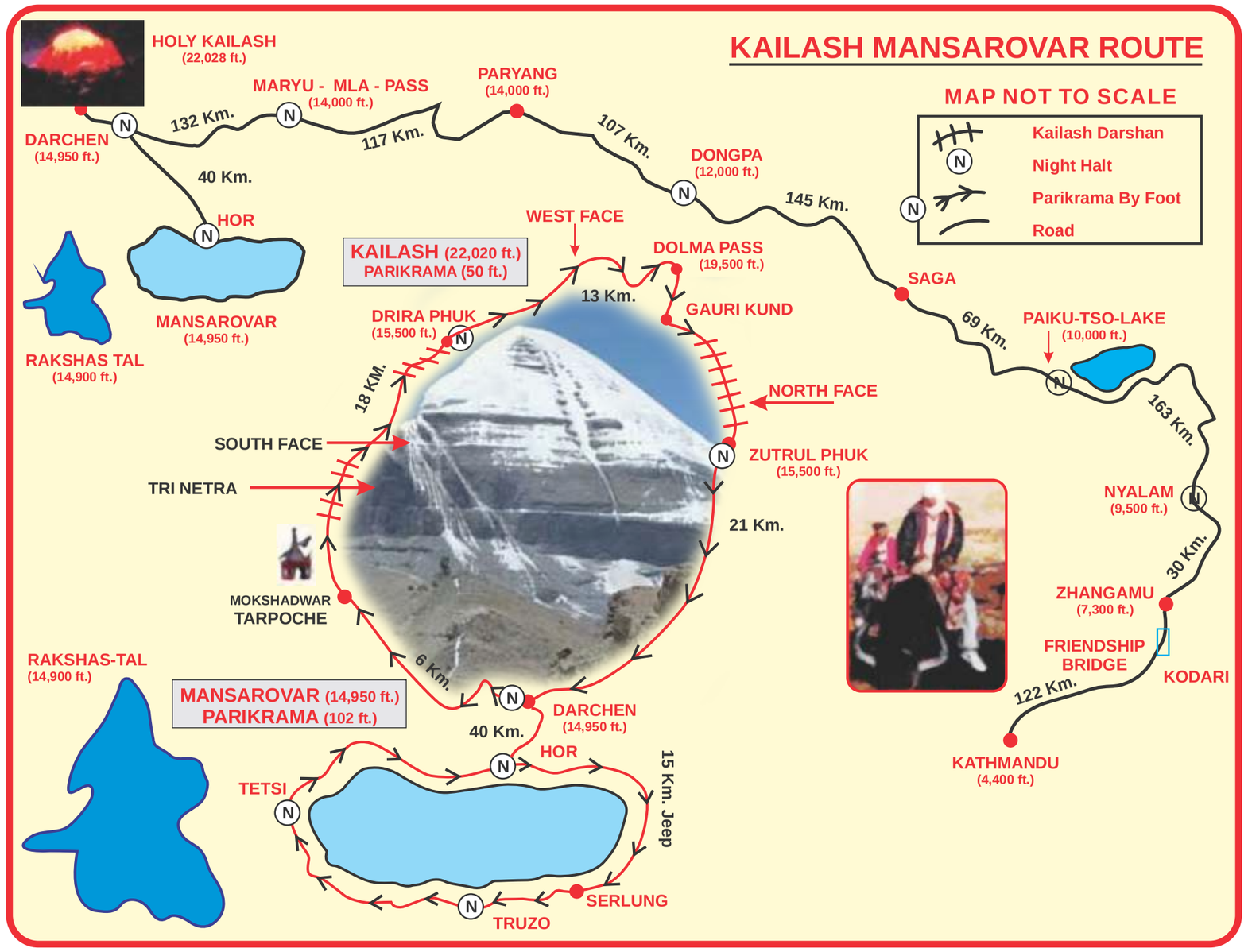
Several written materials and articles were collected on Ashtapad from scriptures and compiled in different volumes. This book which is a compilation of material gathered talks about life of Arhat Rushabh, who breathed his last and attained parinirvana. Arhat Rushabh lived the life of a prince for two million years and ruled as a king for six million and three hundred thousand years.

The book also talks about time of Lord Adinath, ancient Jain Tirth, India's Digambar Jain Tirth and Jainism in Central Asia where Jain religion literature is mentioned. The location of Ashtapad is still being searched as to where in the Himalayas it is situated.

Dec. 31st 2011
DNA, corespondent,
Ahmedabad.


Towards the source of Brahmputra
Hode Choo
Seralum
Hot's Print
Trag Sampo River
Tugu
Lagna
Barkha
Chiu
Gangi Choo
Laldi
Mansarovar Lake
Lalsi
Rakshas Taal
Toshirma Island
Lapchi Island
Gurla Mandhata
Taklakot
Karnali River
Towards Tirthapuri
Satluj River
Dera Puk
Tarchen
Tarchen
KAILASH
Towards source of sindhu
Vehicle way
TRacking way
River
Main Lake
Gompa
Guest House
Village


KAILASH PARIKRAMA
Tracking way
Inner Parikrama
Nandi Parikrama
Simple Parikrama
Inner parkrama
Gauri Kund
Khande Sanglam
Nandi Parikrama
Nandi Parvat
Zuthrul Phug
Dira Phug
KAILASH
Ashtapad
Gangta
Darchen
Towards Manas & Taklakot
Kailash Parikrama Marg
Sherlung
Towards Tirthapuri
Tugu Gompa
Darpoche
Vechicle way
River


KAILASH MANSAROVAR ROUTE
MAP NOT TO SCALE
Kailash Darshan
Night Halt
Parikrama By Foot
Road
HOLY KAILASH
(22,028 ft.)
DARCHEN
(14,950 ft.)
MARYU - MLA - PASS
(14,000 ft.)
PARYANG
(14,000 ft.)
DONGPA
(12,000 ft.)
SAGA
PAIKU-TSO-LAKE
(10,000 ft.)
NYALAM
(9,500 ft.)
ZHANGAMU
(7,300 ft.)
FRIENDSHIP BRIDGE
KODARI
KATHMANDU
(4,400 ft.)
132 Km.
117 Km.
107 Km.
145 Km.
69 Km.
163 Km.
30 Km.
122 Km.
40 Km.
HOR
MANSAROVAR
(14,950 ft.)
RAKSHAS TAL
(14,900 ft.)
KAILASH (22,020 ft.)
PARIKRAMA (50 ft.)
WEST FACE
DOLMA PASS
(19,500 ft.)
13 Km.
DRIRA PHUK
(15,500 ft.)
GAURI KUND
18 KM.
NORTH FACE
SOUTH FACE
TRI NETRA
ZUTRUL PHUK
(15,500 ft.)
21 Km.
MOKSHADWAR
TARPOCHE
6 Km.
MANSAROVAR (14,950 ft.)
PARIKRAMA (102 ft.)
DARCHEN
(14,950 ft.)
40 Km.
HOR
15 Km. Jeep
TETSI
SERLUNG
TRUZO

KAILASH AREA MAP

Dira Phug
Cave of the Female-Yakhorn (inside of Monastery)
Kailash View
Damding Donkhang
Belung Chu
Jarok Donkhang
Shiva-Tshal
Dikpa Kar-nak
Sin-Testing Stone
Place of death
Dölma La
Boulder depicpting Tara
Lake of Compassion
Thugkye Chenpo Tsho (Gauri Kund)
Sharma Ri
Dolma La-Chu
Gesar Ling
Vidschaya
Kailash Views
Cherresi (Avalokiteshvara)
Chana Dorje (Vajrapani)
Three Patron Bodhisattvas
Jampeyang (Manjushri)
Kailash View
Rock associated with Mahakala
2nd Prostration Point
Milarepa's Footprint
Admission only after 13 Kailash-circumambulations
Gangpo-Sanglam La
Milarepa's Footprint
Lha Chu
Three Pinnacles of Longevity
Ariitayus
Tara
Gangjam Glacier
Polung Glacier
Tö Gang Rinpoche/Gang Ti-se
Mount Kailash
6638
Guru Rinpoche Torma
Dharma King Norsang
Serdung Chuksum La
13 Drigung-Kagyü Chörten
Gangpo-Sanglam Chu
3rd Prostration Point
Kailash View
Kapala Tsho
Kavala Tsho
Chuku/Nyan-ri Gönpa
Pema Phug (Lotus Cave)
Langchen Bel-phu (Elephant Cave)
Sky Burial Site of the 84 Mahasiddhas
Milarepa's Footprint
Dirpoche
Gang-nyi Chorten
Saga Dawa, Festival: Full moon day in May or June
Admission only after 13 Kailash-circumambulations
Serlung
Serlung Chu
Gyangdrag Gömpa
Gyangdrag Chu
Chig-Tshal-Gang
1st Prostration Point
1st Kailash View
Zuthrul Phug Gömpa
Milarepa's Cave (inside of Monastery)
Waterfall
Tsabulya
Lha Chu
Tibetan Medical Clinic Mt. Kailash
4670
(GPS: 4755)
DARCHEN
Darchen Chu
Dzong Chu
4th Prostration Point
Permit Checkpoint
Trungto

Legend

- Highway (unpaved)
- Main road (unpaved)
- Trail, footpath
- Kailash Kora (circumambulation) 53 km
- Track
- Trail to Monastery Serlung Inner Kora (Nangkor), admission only after 13 Kailash-circumambulations
- Passage for tourists not allowed or undesirable
- Glacier
- Rock, gravel, barren land
- Pasture land
- Sand and gravel
- Swamp
- View point
- Monastery
- Flagpole
- Important ritual place
- Ritual place
- Chörten
- Little Chörten
- Milarepa's Footprint (Shabje)
- Prostration point
- Ruined building
- Cliff
- Contour line (20m)
- Contour interval (100m)
- Point of altitude (in meters) 1374
- Pass
- Bridge local type
- Cave
- Shelter
- Pilgrims' tented camp
- Suitable for camping
- Hospital

1 0 1 2 3 4 km

Scale 1:50 000 Massstab 1:50 000

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Karto-Atelier A.Rohweder CH-8127 Forch Switzerland.

Timeline Chart

Years	Geography Climate Environmental Changes in Ancient Time- Tibet/ Worldwide	Jainism, Rushabhdev End of 3rd Era of Avsarpini period is period of Rushabhdev as per scriptures	Indian History, Culture and Literature	Tibet History, Buddhism in Asia, Tibet, China, India
15000-10000 B.C.	Ice age			
10000 B.C.	Interglacial Period; Warming trend begins worldwide	Period of Rushabhdev as per Dr. Rajmal Jain's calculations -Not as per scripture		
10000-5500 B.C.	Tibetan climate grows favorable; wider variety of plants & animals			
9000-8000 B.C.	Ice Melts			
7800 B.C.	Monsoons begin in India			
7323 B.C.		Munisuvrat Swami birth as per calculations, not as per scripture. Period of Ramayan	Ramayan	
5000 B.C.	Tibet warmer and more forested than at present	Munisuvrat Swami did Tapasya at Kailash as per Tibetan article		
3800 B.C	Sharp cooling			
3500 B.C.	Saraswati perennial			
3300 B.C.			Period IV of Mehrgarh ends, The Bronze Age, Indus Valley Civilization	
3228- 3102 B.C.			Krishna's birth	
3200 B.C.		Birth and period of Neminath and Girnar as Nirvana Bhoomi - period of Krishna		
3100 B.C.	Saraswati disappears. Yamuna Desert expands		Period of Mahabharat, Post Vedic period. Vyasa, Krishna	
3000 B.C.	Desert expands, Flooding		Mragasiras (Orica)	
2900 B.C.	Warming trend		Early Sutric, Nirukta. Vedic altars	
2800 B.C.			Kot Diji phase of the Indus Valley Civilization begins. Use of Indus script	
2600 B.C.			Mature Harappan phase of the Indus Valley Civilization begins	
2500 B.C.	North Africa dries			
2200 B.C.	Major Drought begins			
2000 B.C			Decline of Rigveda Battle of ten kings. End of Sutric period	
2000-1500 B.C.		Indus Valley civilization mentions Tirthankaras. Vedas indicates pre-historic origin		
1800 B.C.			Atri	
1750 B.C.			Harappa ends	
1600 B.C.			Sudas, Vishvamitra, Vashishtha	
1500-500 B.C.			The Vedic era, the foundation of Vedic Civilization. Period of Vedas	
1063 B.C.				Bon religion established
1000 B.C.	New Ice Age. Climate- harsher, drier: lakes & forests decrease		Post Vedic period	
900 B.C.		Time of Parshvanath (23rd)		
881 B.C.				A traditional date for Pari Nirvana of the Buddha
600 B.C.			Vedanga Jyotisa, Lagadha, Sixteen Maha Janapadas, Vedic Civilization ends	
599 B.C.		Mahavira, 24th Tirthankar of Jainism is born. United Mahavir Sangh		
590 B.C.		Gautam Swami visited Ashtapad		
563 B.C.				Gautam Buddha, founder of Buddhism is born
530 B.C.			Cyrus the Great conquers northwestern Indian subcontinent	
528 B.C.				Siddhartha Gautama achieves enlightenment
527 B.C.		Mahavira Nirvana		
507 B.C.		Gandhar Sudharma swami, earliest written records in brahmi script		
500 B.C.		Sixteen "republics" or Mahajanapadas has been established		Little Kingdoms war with each other
483 B.C.				Pari Nirvana of the Buddha (Western view)
400 B.C.				Gautama Buddha found Buddhism in S. Nepal
350 B.C.			Panini describes the grammar and morphology of Sanskrit.	
326 B.C.			Ambhi King of Taxila surrenders to Alexander	
321 B.C.			Chandragupta established Mauryan Empire	
300 B.C.		A Jain Community forms in the trading center of Mathura		
300 B.C.- 500 A.D.		Jainism evolves into two sects being Shwetambar and Digambar	Alexander the great defeated Darious III. Macedonian Empire established	
293 B.C.		The most reliable date of the great famine		
259 B.C.			Ashoka rules Mauryan Empire; converts to Buddhism	King Ashoka converts to Buddhism- sends Buddhist missionaries
251 B.C.				Ashoka's son Mahinda introduces Buddhism to (Sri Lanka)
250 B.C.			Khotan established by Ashoka's son	
250-100 B.C.				7 Khri: gNya', Mu, Ding, So, Mer, Gdags, Srib
247 B.C.				gNya'-khri-bstan-po, 1st king of Tibet arrives in Yar-lung. Sum-pa shamans subdued.
				Ashoka calls Buddhist council at Patna to codify canon of scriptures
232 B.C.			Ashoka dies and is succeeded by Kunala	
200 B.C.		Gradual split of the Sangh	Tholkappiyam describes the grammar and morphology of Tamil	Buddhism spreads in central Asia
185 B.C.			Greek King Demetrius rules Bactria. Greek influence extends into N.W. India	
184 B.C.			The Mauryan Empire collapse. Pusyamitra Sunga established Sunga dynasty	
183 B.C.			Pusyamitra Sunga gets power in palace revolt; established capital at Videsa	
180 B.C.			Establishment of the Indo-Greek kingdom.	
175 B.C.			Kharvel brings the Indian Subcontinent under his control	Little Yueh-chih tribes join Ch'iang in far northeast
160 B.C.			Greek King Menander rules Bactria	
156 B.C.		Period of Bhadrabahu - Scripts written era of Agam Manuscripts		
150 B.C.				Period of 2 sTengs. Gri-gum killed- sons flee to Kong-po. Bya-khri returns to power.
127 B.C.				Tibetan kingdom of Nyatri Tsenpo
115 B.C.				Some Ch'iang tribes allied with Hsiung-nu in far northeast
100 B.C.				Jo-ch'iang tribes in far north trade routes through Khotan
80 B.C.			Establishment of the Indo-Scythian kingdom	
65 B.C.			The Pandyan king sends ambassadors to the Greek and Roman lands	
57 B.C.			Beginning of Vikram Era	
50 B.C.				Six Sa'i-legs: E-sho, De-so, Thi-so, Gong-ru, Brong-gzher, I-sho
				Hinayana Buddhism spreads in Ceylon, Burma, Thailand
24 B.C.				The Mahaviranhara and Abhayagiri monasteries are founded in Ceylon
0 B.C./ A.D.		Acharya Umaswati, Acharya Kundakunda, Acharya Samantabhadra		
9-23 A.D.			Establishment of the Indo-Parthian kingdom	
25-220 A.D.			Establishment of the Kushan empire by Kujula Kadphises	
56-115 A.D.			Gautamiputra Satkarni becomes Satavahana emperor	
			Starts Shalivahana era calendar, defeats Scythian king Vikramaditya	
68 A.D.				Mahayana Buddhism is introduced in China
100 A.D.		Separation of Shwetambar & Digambar. A. Kund Kund - Samay Saar manuscript	Kushan Empire expands to northwest- 1st emperor is Kujula Kadphises	Eight Ide. The Pure Land sutra is composed
		Period of Uma Swami - Tatvarth Sutra Manuscript was written by him.		
200 A.D.		Mountains of Samet Shikharji were gifted by King of Palghar to Jain community		
225 A.D.			Sri-Gupta starts the Gupta Empire in Magadha, capital in Patliputra	
300 A.D.			Indianized states in southeast flourish. Rise of Ganag & Kadamb Dynasty	Five Btsan
300-550 A.D.			Vakatakas rule south India	
320 A.D.			Beginning of Gupta Era: peace and prosperity; end of republican states	
350 A.D.				Huiyuan founds Pure Land Buddhism in China
366 A.D.				Buddhists begin the Mogao caves near Dunhuang in China
372 A.D.				Buddhism is introduced in Korea from China
374 A.D.				Birth of Iha-tho-tho-ri, last of Five bTsan
376-415 A.D.			Chandragupta II: height of Gupta Empire; Sakas expelled from western India	
380 A.D.				Monks carve 2 giant Buddha statues in rock at Bamiya, Bactria (Afghanistan)
400 A.D.		A. Siddhasen Diwakar, Devarddhi Kshmashraman, Pujyapada and Haribhadra Suri	Gupta Empire, in north and south. Hinduism and Buddhism spread to Asia	
433 A.D.	**GEOLOGIC TIMESCALE**			lHa-tho-tho-ri receives Buddhist texts, sacred objects, mantra
460 A.D.			King Skandagupta defeats Huns in western India; Huns control Gandhara	Buddhists begin the Yungang (Yun-Kang) caves near Datong in China
495 A.D.	Time starts 6.5 to 7 billion yrs ago			Khri-gnyan-gzung-btsan rules at Yar-lung. Yun-kang cave temples in China
500 A.D.		Period of Devardhi Gani - Agam manuscripts (Kalpsutra)	King Ashoka rules. Hun controls northwest India. Decimal system invented	
500-600 A.D.	Solar System formed 6 billion yrs ago		Advances in sciences: logic, astronomy, algebra, arithmetic, epistemology	
500-1300 A.D.			Buddhism declines in India	
520 A.D.	Earth formed at 5.5 billion yrs ago (in Gaseous State)			Brong-gnyan-Ide'u rules at Yar-lung; marries mChims-bza'
				Bodhidharma travels to China and founds Chan (Zen) Buddhism
528 A.D.	Precambrian Era: 5000 to 750 million yrs			Kingdom of Silla adopts Buddhism as the state religion
530 A.D.			Baladitya defeats Mihirakula, son of Toramana	
538 A.D.	Paleozoic Era: 750 to 250 million yrs			A delegation from Korea introduces Japan's emperor to Buddhism
540 A.D.				sTag-ri-gnyan-gzigs rules at Yar-lung; allies with neighboring nobles
560 A.D.	Mesozoic Era: 250 to 65 million yrs			gNam-ri renew alliance, marries 'Bri-bza', poisoned by conspirators
560-569 A.D.				gNam-ri conquers other areas. Birth of Srong-Btsan-sgam-po in Mal-dro
581 A.D.	Cenozoic Era: Tertiary Period: 65 million years to 2 million yrs			Srong-Btsan-sgam-po Ascends throne at age thirteen
			Chalukya Dynasty	Thon-mi Sambhota develops script and grammar. Constitution written by King
600 A.D.	Quaternary Period: Pleistocene Epoch; 2 million to .01 million yrs			Buddhist texts translated into Tibetan
602 A.D.				Tibet is unified under Namri Songtsen
606 A.D.	Pleistocene Period: Glaciation throughout the world		Harshavardhana crowned Monarch	
621-624 A.D.				Marriage to Nepalese princess
629 A.D.	Glaciers started melting; human life came in existence - 10, 000 B.C.			Tibet expands under Songtsen Gampo
634 A.D.			Chalukya power at its peak. Pulakesi II pushes north; defeats Harshavardhana	mGar to China. Frontier tribes submit to king
637 A.D.	Holocene Epoch: 0.01 million yrs to Present			Songtsen Gampo builds the first Potala in Lhasa
641 A.D.				Marriage to Chinese princess
644 A.D.				Conquest of Zhang-Zhung
648 A.D.				Tibetan troops sent to India
649 A.D.				Srong-Btsan-sgam-po writes to Kao-tsung
650 A.D.				Death of Srong-Btsan-sgam-po
650-676 A.D.				Mang-srong reigns in Tibet
662 A.D.				Turkish-Tibetan alliance begins

Years	Geography Climate Environmental Changes in Ancient Time- Tibet/ Worldwide	Jainism, Rushabhdev End of 3rd Era of Avsarpini period is period of Rushabhdev as per scriptures	Indian History, Culture and Literature	Tibet History, Buddhism in Asia, Tibet, China, India
663 A.D.		Aacharya Haribhadrasuri		
667 A.D.				Death of Minister mGar
670-692 A.D.				Tibet controls Silk Route; empire reaches to east, north and south
676-704 A.D.				Dus-srong reigns in Tibet
687-89 A.D.				Tibetan troops in Turkish lands
692-694 A.D.				China regains Silk Route oasis states
699 A.D.				mGar brothers disgraced
700 A.D.		8000 Jain massacred in Madurai	Rise of Rashtrakuta	
700-704 A.D.				Tibetan troops in Ferghana and Tokharia
700-800 A.D.				Tantric themes in Khotanese and Kuchean art
703 A.D.				Black and white Mya-ba in 'Jang submit to Tibet
704-755 A.D.				Mes-ag-tshoms rules Tibet
710 A.D.				Marriage alliance between Tibet and China
712 A.D.			First Muslim, Md. Bin Qasim defeats Raja Dahir	T'ang Emperor Hsuan-tsuang favors Taoism
715 A.D.				Arab-Tibetan alliance
716 A.D.				Pure land teacher Ts'u-min returns from India
720 A.D.				Vajrabodhi, Tantric master at Nalanda, travels to China
720-740 A.D.				Tibet gains control of both Bru-sha and sBal-ti in far west
720-814 A.D.				Po-changHuai-hai, Ch'an master
727 A.D.				Tibetan troops attack Kan-chou and Kua-chou
730 A.D.				Treaty between Tibet and China
734 A.D.				Marriage alliance with Turks
736 A.D.				Amoghavajra, disciple of Vajrabodhi, takes texts to China
742 A.D.				Birth of Khri-srong-Ide-btsan
745 A.D.				Tibetan allies, W. Turks, crushed by Uighurs
747 A.D.				T'ang forces drive Tibetan troops from Bru-sha
750-770 A.D.			Gopala rules Bengal, elected as king by popular vote; builds university of Odantapuri	
751 A.D.				Nan-chao ('Jang) submits to Tibet. Battle of Talas: defeat Chinese
756-797 A.D.				Reign of Khri-srong-Ide-btsan
757-800 A.D.			Krishna, greatest King of Rashtrakuta dynasty in Southern India	
762 A.D.				Khri-srong-Ide-btsan invites Santaraksita and Padmasambhava
762-763 A.D.				Founding of bSam-yas monastery. Tibetan troops invade N. India, China
763 A.D.				Uighur rulers convert from Buddhism to Manicheanism
766 A.D.				Tibet takes Kan-chou
767-775 A.D.				Completion of bSam-yas. Proclaims Buddhism as the religion of Tibet
770-810 A.D.			Dharmapala rules Bengal- Bihar, Kanauj, Avanti, Kuru, Punjab, Gandhara	
776 A.D.				Kua-chou captured by Tibet
780 A.D.				Hami taken by Tibet. The first monastery founded in Samye by Guru Rinpoche
781 A.D.				Monks invited from China
783 A.D.				Treaty with China sworn at Ching-shui
787 A.D.				Tibet takes Tun-huang. Tibetan Buddhist artists working at Tan-huang
789 A.D.				Tibetan-Arab alliance ends
790-850 A.D.				Tibet controls Khotan Silk Route
792-794 A.D.				bSam-yas debate: Kamalasila, disciple of Santaraksita, invited to Tibet
797-800 A.D.				Mu-ne-btsam-po rules, attempts to equalize wealth
800 A.D.		Acharya Akalanka		Buddhist art of Karakhoto shows Tibetan influences
800-814 A.D.				Sad-na-legs rules, supports Dharma. Treaties or agreements with neighbors
809 A.D.				Tibetan and Turkish troops support rebels in Sogdia against Arabs
810 A.D.				T'ang Emperor Hsien-tsung requests return of Chinese territories
810-850 A.D.			Devapala maintains Pala empire; contacts with Indonesia ruler Sailendra	
814 A.D.			Nripatunga Amoghavarsha I becomes Rashtrakuta emperor	
814-836 A.D.			Kannada literature flourishes	Ral-pa-can rules, supports Dharma. Standardization of translation terminology
820 A.D.			Death of Sankaracharya, Vedanta philosopher	
822 A.D.				Peace Treaty with China, Uighurs and 'Jang. Retain own territories
836-838 A.D.			Gurjara-Pratihara	Ral-pa-can assassinated. Gland-dar-ma takes throne. Buddhists persecution begins
840-885 A.D.			Mihira Bhoja, Pratihara ruler of Kanauj, pushes out Palas	
841 A.D.				Glang-dar-ma assassinated
843-905 A.D.				Od-srung rules central Tibet
846 A.D.			Ceylon capital moved- Anuradhapuramto Polonaruwa to defend Chola invasions	
848-861 A.D.				Tun-huang revolts
866 A.D.				Ulghurs take Tibetan forts in eastern Central Asia
877 A.D.				Tombs of kings vandalized
900 A.D.		Period of Nemichandraji, Tirumalai temple established in Tamil Nadu		
906-924 A.D.				dPal-'khor rules central Tibet
929 A.D.				Rebellion in central Tibet: Nyi-ma-mgon goes west to mNga'-ris
975 A.D.				Khor-re (Ye-shes 'Od) rules Gu-ge
981 A.D.		Construction of Gommateśvara and Statue of Lord Bāhubalī		
1000 A.D.		Emergence of Śhwetāmbara Gacchas - Tapā Gachha and Kharatara Gaccha	Rise of hoysalas, Chauta dynasty	
1032 A.D.				rGyal-sras rules
1042 A.D.				The Indian mystic Atisha visits Tibet (Kadampa teachings)
1080 A.D.				The Tibetan poet and mystic Milarepa
1100- 1200 A.D.		Construction of Delwara temples at Mount Ābu built by Vastupāla & Tejapāla		
1200 A.D.		A. Jindattasuri, Hemachandra Suri & Abhaya Dev. Formation of Aachala Gaccha		
1206 A.D.			Gakhars kill Muhammad Ghori during a raid on his camp on the Jhelum River	
1221 A.D.			Genghis Khan invades Punjab	
1247 A.D.				Mongols become de facto rulers of Tibet but Sakya monks become their tutors
1253 A.D.				Kublai Khan declares Buddhism the state religion of his empire
1300 A.D.		Many Acharyas and communities emerge - gains support from Kings	Muslim and Turkish invasions in India	
1300-1526 A.D.			Sikhism emerges	
1350 A.D.			Rise of Saluva rulers in Karwar, Karnatak	
1398 A.D.			Timur plunders Lahore	
1401 A.D.			Dilawar Khan establishes the Malwa Sultanate in present-day northern India	
1445 A.D.				Shigatze monastery founded by Gendun Drup , later recognized as first Dalai Lama
1451 A.D.		Lonkashah founded the Dhundhia Order of Jainism		
1474 A.D.		Establishment of non-image worshipping Śhwetāmbara sect of Sthānakvasi		
1500 A.D.		Founding of Terapantha. Digambar-Teranpantha		
1526 A.D.		Jain Communities evolve	Battle of Panipat	
1526-1818 A.D.		Several Jain sects emerge	Mughals rule in India	
1556 A.D.			Hemu defeats Akbar's forces at Agra & Delhi. 2nd Battle of Panipat; Hemu killed	
1571 A.D.			Akbar annexes Gujarat, also shifts the Mughal capital to Fatehpur Sikri	
1586 A.D.			Akbar annexes Kashmir	
1601 A.D.				Mongol emperor appoints grandson of Altan Khan as Dalai Lama, causes civil war
1605 A.D.			Akbar dies	
1610 A.D.			British East India company (1612 to 1757)	
1611-1665 A.D.		Acharya Yasovijaya.		
1630 A.D.	All events given in the chart are from 15, 000 yrs to present		Birth of Shivaji	
1648 A.D.				Potala built in Lhasa
1658 A.D.	Columns have 3-4 different items written in different colors		Shah Jahan completes Taj Mahal, Jama Masjid, Red Fort	
1663 A.D.		Lonka became Sthanakvasi		
1683 A.D.	Refer to scripture for details about Avsarpini period in Granth I	Establishment of Digambar sect of Terapantha by a Śhwetāmbara Banarasidas		
1684 A.D.				Tibet is defeated by Ladaq and Bhutan
1707 A.D.	Gautam Swami visited Ashtapad - 2600 yrs ago		Death of Aurangzeb the Mughal emperor	
1743-1889 A.D.		Aanandanghanji Maharaj, Mahopadhyay Yashovijayji		
1760 A.D.	When and how Ashtapad was destroyed, one does not know	Separation of Ā. Bhikshu from Sthānakavasi; begins Śhwetāmbara Terāpantha	The Marathas are routed Third Battle of Panipat by Ahmad Shah Abdali	
1799 A.D.			Fourth Anglo-Mysore War ends, death of Tipu Sultan, victory for East India Co.	
1800 A.D.	Information is collected from various sources		Swami Vivekananda. Death of Nana Fadnavis	
1801 A.D.			Ranjit Singh establishes Khalsa rule of Punjab. Army liberates Kashmiri Pundits	
1807 A.D.	**References**		East India Co. signs treaty of Amritsar with Maharaja Ranjit Singh	
1826-1947 A.D.			British rule in Burma	
1841 A.D.	Ancient Tibet---- The Yeshe De Project			An Indian kingdom invades Tibet
1867 A.D.		Shrimad Rajchandra born		
1880 A.D.	Jainology timeline adopted from Jain Digest and History	Acharya Rajendrasuriji		
1893 A.D.		Virchand Raghavji represented Jainism at first World Religion Conf., Chicago		
1900 A.D.		Founding of Kanji Panthj. Karpurvijayji		
1934 A.D.		Kānjisvāmi from Sthānakavasi establishes Digambara Kānjipantha		
1949 A.D.				China invades eastern Tibet
1951 A.D.				China annexes the whole of Tibet
1959 A.D.				Tibetans riot against Chinese occupation. Dalai Lama escapes to India
1963 A.D.		Death of Rajendra Suri who wrote the Abhidhana - Rajendra Kosh		
1966 A.D.				During the "cultural revolution" 2,692 Tibetan monasteries destroyed
1970 A.D.		Jainism spreads overseas. Sushil Kumarji & Chitrabhanuji preach Jainism abroad		
1981 A.D.		1st Jaina Convention (L.A.)		
2000 A.D.			Tagore prominent in India; Mahatma Gandhi leads India to independence	